

April 1944

TECHNOLOGY REVIEW

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Building Today For a Better Tomorrow

Somewhere out in the South Pacific, or over in Southern Italy . . . a soldier clad in American khaki lies on his belly in the mud . . . lost from his buddies . . . and hungry as hell. In his kit thank God! . . . he still has a few Ration C Biscuits, enough to keep him alive . . . until. ♡ But here in America, at home most of us, surrounded by smiling, friendly faces . . . and with a comparative abundance . . . we sometimes complain about butter being short, or meat missing from the table. ♡ Why? Because we're all used to so much! ♡ And, truth to tell, it's only natural for Americans to be grouchy and grumpy when things aren't just so. ♡ That's the spirit of dissatisfaction which drives this nation forward . . . ever forward . . . in search of something better, and more of it for everyone. ♡ That's the case with our company this very day. For in addition to baking Ration C

and Ration K Biscuits for our boys on the world's battlefronts . . . we're building for a better tomorrow here at home. ♡ In our several plants, Carr Bakers are carrying on experiment after experiment with many new products . . . while striving to achieve a *new* perfection in our present production. Research laboratories, too, are hard at work for us. *All are perfecting for tomorrow.* ♡ Engineers are planning new ovens, new machinery, new plants . . . and on the drawing boards of America's foremost designers, beautiful and highly functional new packages are taking form. ♡ Yes, even while we are doing our bit to help America speed the Victory and win the Peace . . . *Carr Bakers are developing tomorrow's better products today.*

J.B. Carr
Class of '16

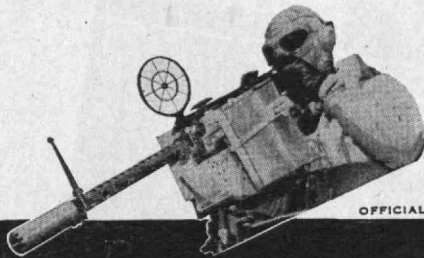
President, J. B. Carr Biscuit Company



J. B. Carr Biscuit Company

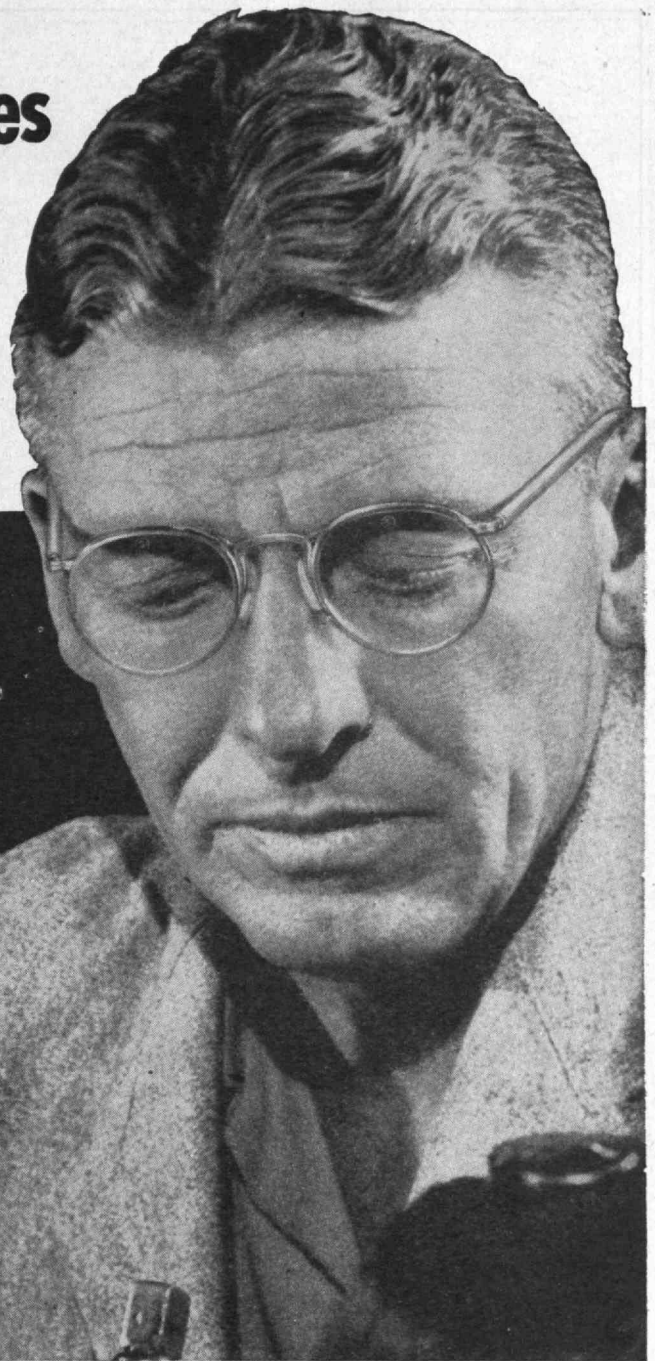
Wilkes-Barre, Pa. • New York, N. Y. • Peoria, Ill. • Greenwood, S. C.

Keep Your Workers' Eyes Trained on their Work



OFFICIAL NAVY PHOTOGRAPH

WITH AMERICAN OPTICAL GOGGLES



We need more than our workers' hands to win this war . . . we also need their *eyes*. Yet, for lack of proper goggles, industrial eye accidents are *still* occurring at an alarming rate . . . *still* costing our valiant fighting men much equipment that they need to smash the enemy.

Put on an offensive now to stop eye accidents in *your* plant. American Optical Company, pioneer

manufacturer of products to aid and preserve vision, offers you the eye protection equipment and complementary services that your plant needs to protect man-power for war-power. AO Goggles are scientifically designed to give maximum possible protection . . . and workers find them comfortable to wear. Have your Safety Director get in touch with the nearest American Optical Branch Office.

American  Optical

COMPANY

SOUTHBRIDGE, MASSACHUSETTS





Where Office Machines can't be coddled Underwood's the choice...

—From Remote African Base Pan American World Airways reports Hardihood of Underwood Equipment.

No Casualties Permitted—Unlike the 407 cities where service facilities are, even in wartime such remote

vacations, they have required remarkably little special attention.

THIS GOES FOR
RADIO RECEIVERS,
TOO

» It's an old tradition for National equipment to do the tough jobs at inaccessible outposts. Long before the war, National receivers had already become the first choice of expeditions to the far corners of the earth.

» Pan American has long used National equipment, and many years of experience with the ruggedness and dependability of National receivers were back of Pan American's choice in the picture shown above.

NATIONAL COMPANY, INC., MALDEN, MASS.



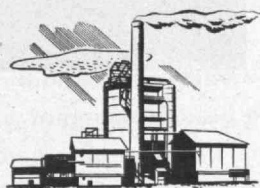
BADGER BRINGS WIDE EXPERIENCE

TO THESE MIGHTY WORLDS OF INDUSTRY*

AN ACCEPTED business axiom is that "cumulative experience in interrelated fields creates an extra measure of proficiency in each of them." It applies with special emphasis to the Badger organization. . . . A long, rich and extremely broad experience is one of the reasons Badger is *always constructive*—confident—never held to hidebound rules or traditions—thoroughly capable of engineering new processes,

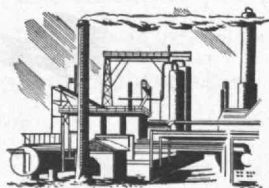
designing new types of equipment, planning and erecting new kinds of plants in the fast-moving chemical, petroleum refining and petro-chemical worlds.

Below are listed some of the various products Badger process engineering and construction services have helped to put into commercial production. *A Bulletin amplifying the scope of Badger activities is available for the asking.*



★PETROLEUM

Aviation Gasoline and all Components • Catalytic Base Stocks • Alkylates • Fractionated Pure Hydrocarbons • Straight Run Base Stocks • Thermally Cracked and Reformed Motor Gasolines • Solvent Refined Lubricating Oils • Solvent Dewaxed Lubricating Oils • Clay Treated Lubricating Oils • Asphalts • All Primary Products from Crude.



★PETRO-CHEMICAL

Butadiene • Styrene • Toluene • Trinitrotoluene • Ethyl and other Alcohols • Acetic Anhydride • Formaldehyde • Nitroparaffines • Chlorinated Hydrocarbons.



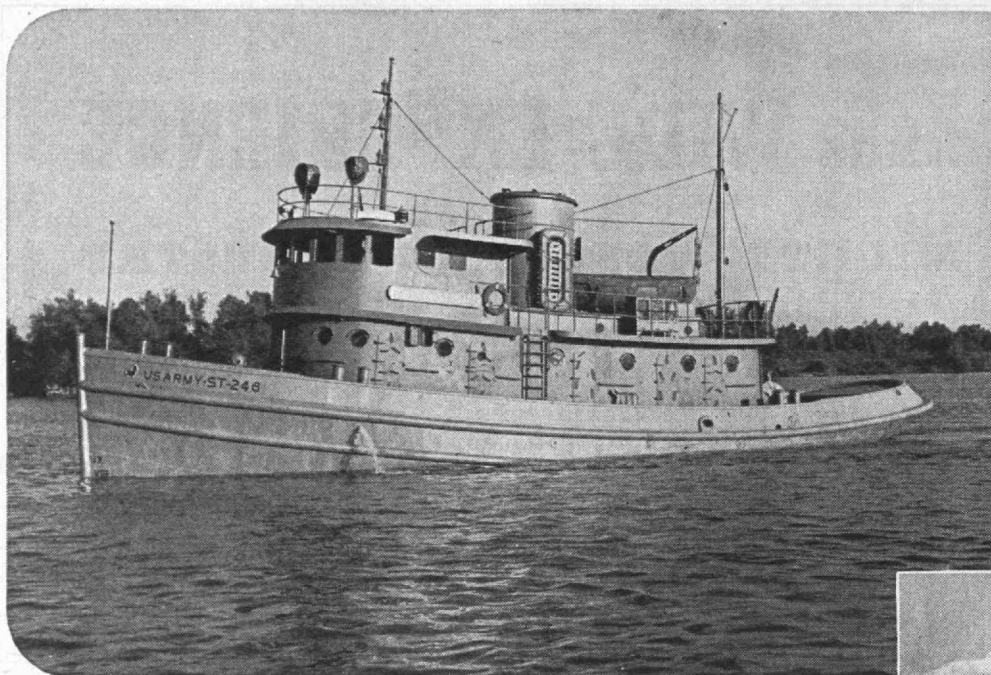
★CHEMICAL

Industrial Ethyl Alcohol, Isopropanol and Higher Alcohols • Methanol, Synthetic and from Wood Distillation • Ethyl Acetate, Butyl Acetate and other Esters • Synthetic Acetic Acid and Acetic Anhydride • Nitrobenzene and other Nitro-Aromatics • Formic Acid and Higher Aliphatic Acids • Carbon Tetrachloride • Chloroform, etc. • Phenol, Cresols, etc., from Tar Acids • Aniline and other Amino-Aromatics • Beverage Alcohol and Spirits • Ethyl Ether and Isopropyl Ether • Acetone and other Ketones • Glycerine and Glycols • Phthalic Anhydride • Styrene • Ammonia • Butadiene • Fatty Acids • Ethyl Benzene • Formaldehyde • Nitroparaffines • Synthetic Phenol • Dibutyl Phthalate • Synthetic Camphor.

E. B. Badger & sons co.

BOSTON . . . EST. 1841

New York • Philadelphia • San Francisco • London

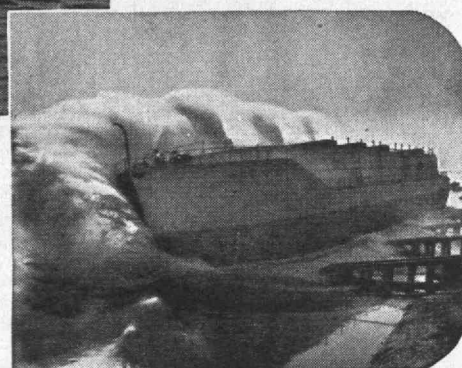


Busch-Sulzer Diesels are being installed in Army towboats, of the type pictured (left), used in securing beachheads. The all-steel lighter (below), launched by a St. Louis shipbuilding concern, will be filled with supplies from transports in the war zones and towed ashore.

She Has Something Else In Tow ...SKILL FOR THE FUTURE

To build engines for towing craft like that pictured here . . . and other engines for the Navy . . . and naval ammunition hoists with watch-like precision mechanism . . . we greatly expanded our facilities and increased our trained personnel by 50 percent within the last 18 months.

May we suggest that you begin now to familiarize yourself with your postwar requirements and acquaint us with them in good time?



For the last three years, our total output naturally was devoted to orders for the Navy, Army, Maritime Commission and projects connected with the war effort. While the need exists, such work will have first call on our full capacity, but when this demand slackens our facilities and our personnel can be devoted immediately to your requirements. Obsolescence and the need for power in new enterprises plus the fact that many Diesel manufactories in other countries have been damaged or destroyed will result in a huge demand for engines. Your inquiry at this time will enable us to plan so that there need be no delay in filling your needs as soon as capacity is available.

BUSCH-SULZER BROS.—DIESEL ENGINE COMPANY
SAINT LOUIS



AMERICA'S OLDEST BUILDER OF DIESEL ENGINES

**BUSCH-
SULZER**
ST. LOUIS

RIGID PLASTIC SECTIONS

Extruded by

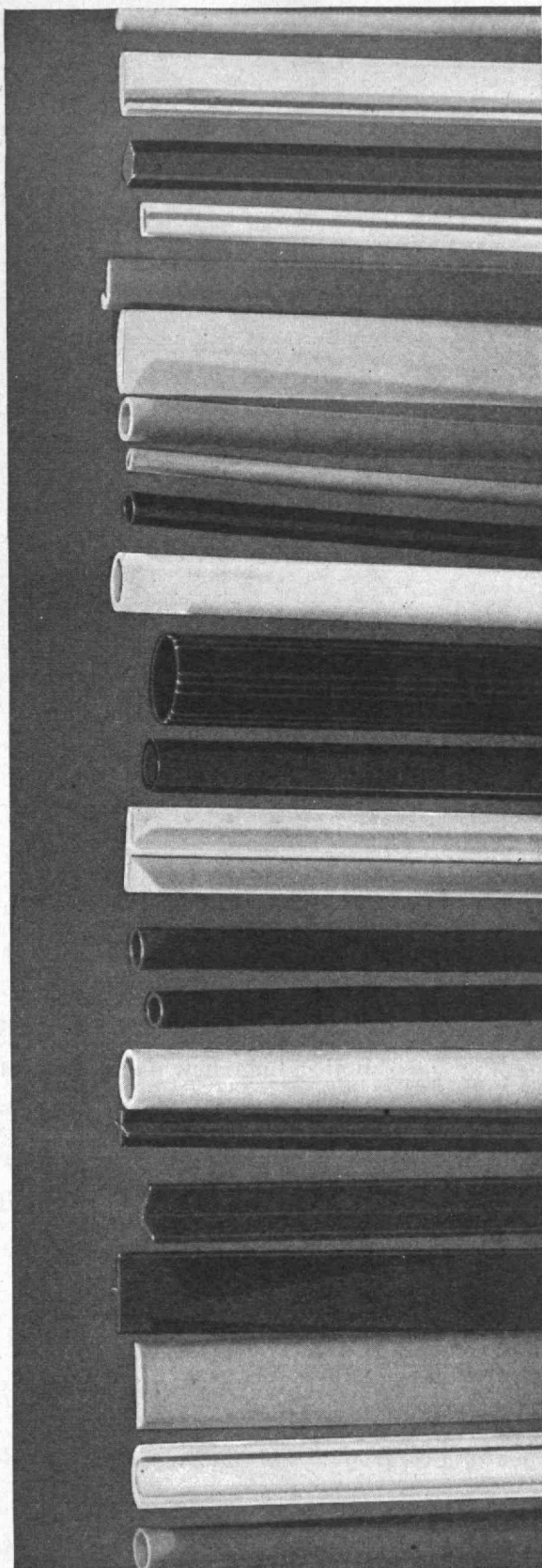
Sandee

*I*F uniform high quality and strict adherence to exacting specifications are required in the rigid extruded plastic sections you need, it's a job for SANDEE! For, here, every modern facility is available to produce better extruded plastic products:

1. Expert tool and die makers
2. Skilled, long-experienced plastics engineers
3. Thermoplastic materials and special Sandee compounds of every description
4. Modern extrusion machines
5. Exclusive, better methods and machinery
6. Prompt delivery

SANDEE Rigid Sections are constantly finding new uses, new opportunities to effect impressive economies in weight, labor, finishing, fabricating as well as add greater utility to many products. Submit YOUR extruded plastic problems to our engineers. Ideas, suggestions, samples and cost estimates incur no obligation.

ELMER SZANTAY, M.E. '35, GENERAL MANAGER

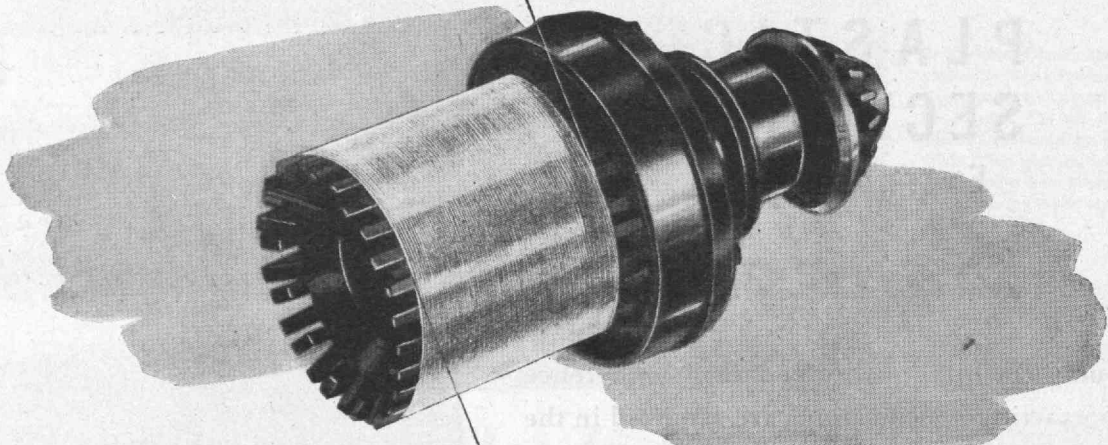


Sandee Manufacturing Company

3945 NORTH WESTERN AVENUE • CHICAGO, ILLINOIS

EXTRUDED PLASTICS AND SPECIAL TOOLS

A "LITTLE THING" ...



... BUT, OH MY!

Above is pictured the famous "Advancing Reel", a development of Industrial Rayon research and invention.

Just as an acorn makes a giant oak, this ingenious little reel built a huge new plant with intricate machines, blocks long.

- It gave the rayon industry a new standard of quality, "Continuous Process" Rayon Yarn. The yarn made by this new production method is so relatively knotless and free of broken filaments, that the cloth woven from it dyes evenly without streaks or filling bands, even in the difficult flat tones. And mill efficiency, on which profits depend, soars with the use of this trouble-shooting yarn.

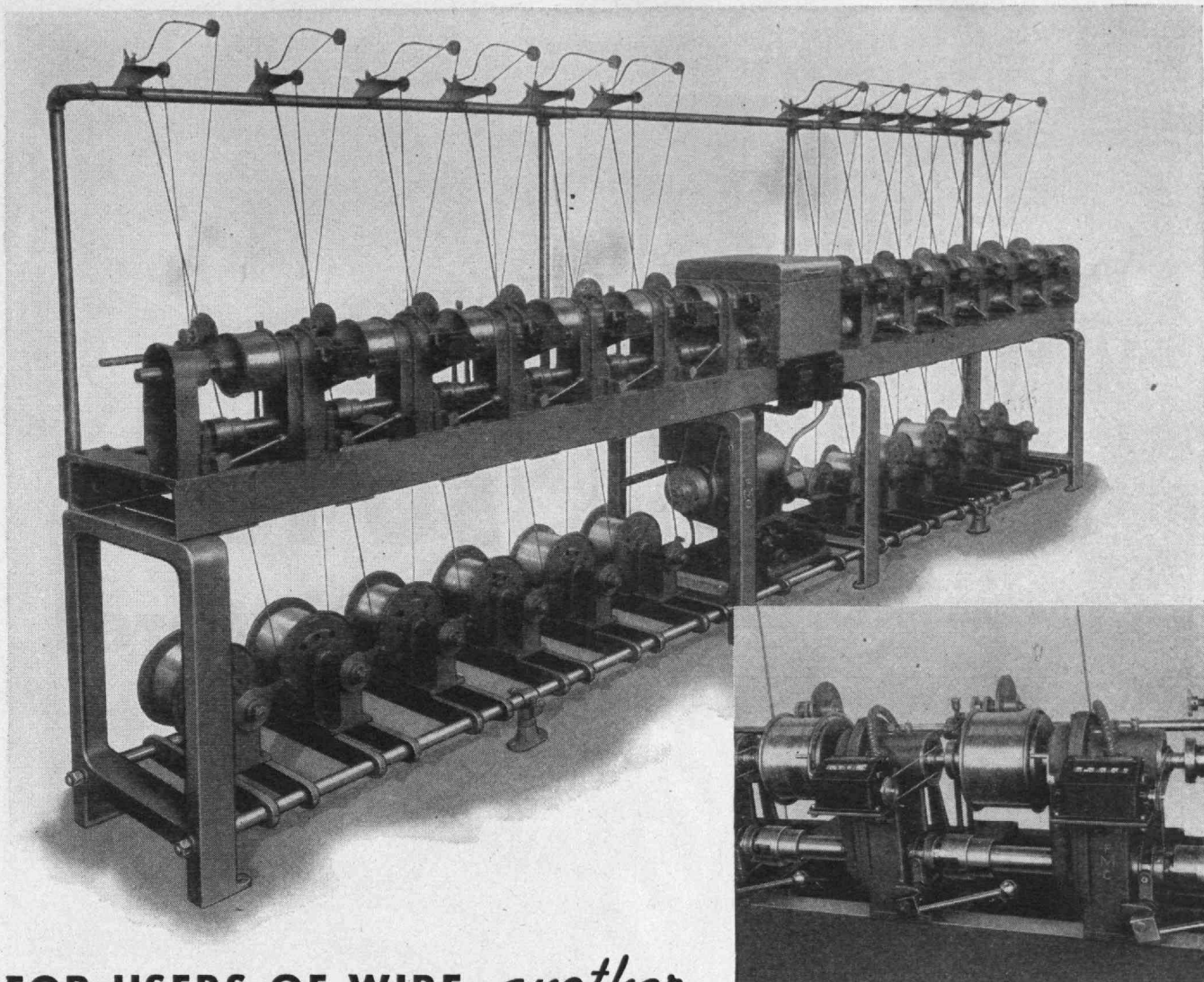
The development of the "Continuous Process" is typical of a company which has long recognized that its greatest assets are not in just plants and inventories, but in the skill and acumen of its engineers and technicians—the men whose genius makes for textile progress.



*Reg. U. S. Pat. Off.

CLEVELAND, OHIO • New York Office: 500 Fifth Avenue

(306)



FOR USERS OF WIRE, *another*
FIDELITY MACHINE that
MULTIPLIES MANPOWER

*Every winding head equipped with large-figure
footage counters, conveniently located for
inspection and control by operator.*

This double-end, screw traverse FIDELITY Wire Spooling Machine is a high production unit. It winds wire at the rate of 600 to 700 feet per minute per spool. On the 12-head machine illustrated, this totals about one and one-half miles per minute. Allowing time for changing spools, this makes possible the winding of 600 or more miles per 8-hour shift.—Accommodates spools up to 9 1/4" diameter.

Adjustable automatic tension device also applies brake to supply spools in case of wire breakage or stoppage of machine. Lateral and diagonal adjustments compensate for variations in width of flanges and size of spools.

Variable speed controls permit winding spools of different diameters at the same linear wire speed.

This same machine built in units handling 4-6-8-10 and 12 spools.

FIDELITY'S comprehensive line of wire winding and wire covering machines is described in a new 20-page catalog. Write for it.




Buy BONDS
to Bring the Boys
Down the Home Stretch

Intricate. Automatic Precision Machines
FIDELITY MACHINE COMPANY

3908-18 FRANKFORD AVENUE

PHILADELPHIA 24, PA.



350 FEET of the future!

You're looking up the "dangle angle" of a Nylon Glider Towrope!

Such a rope... slender, only 11/16" in diameter... recently towed a loaded cargo glider 3500 miles across the Atlantic. Think of it! A tremendous step was taken into the *future* that day... a future to which Plymouth's knowledge and facilities for rope making will greatly contribute.

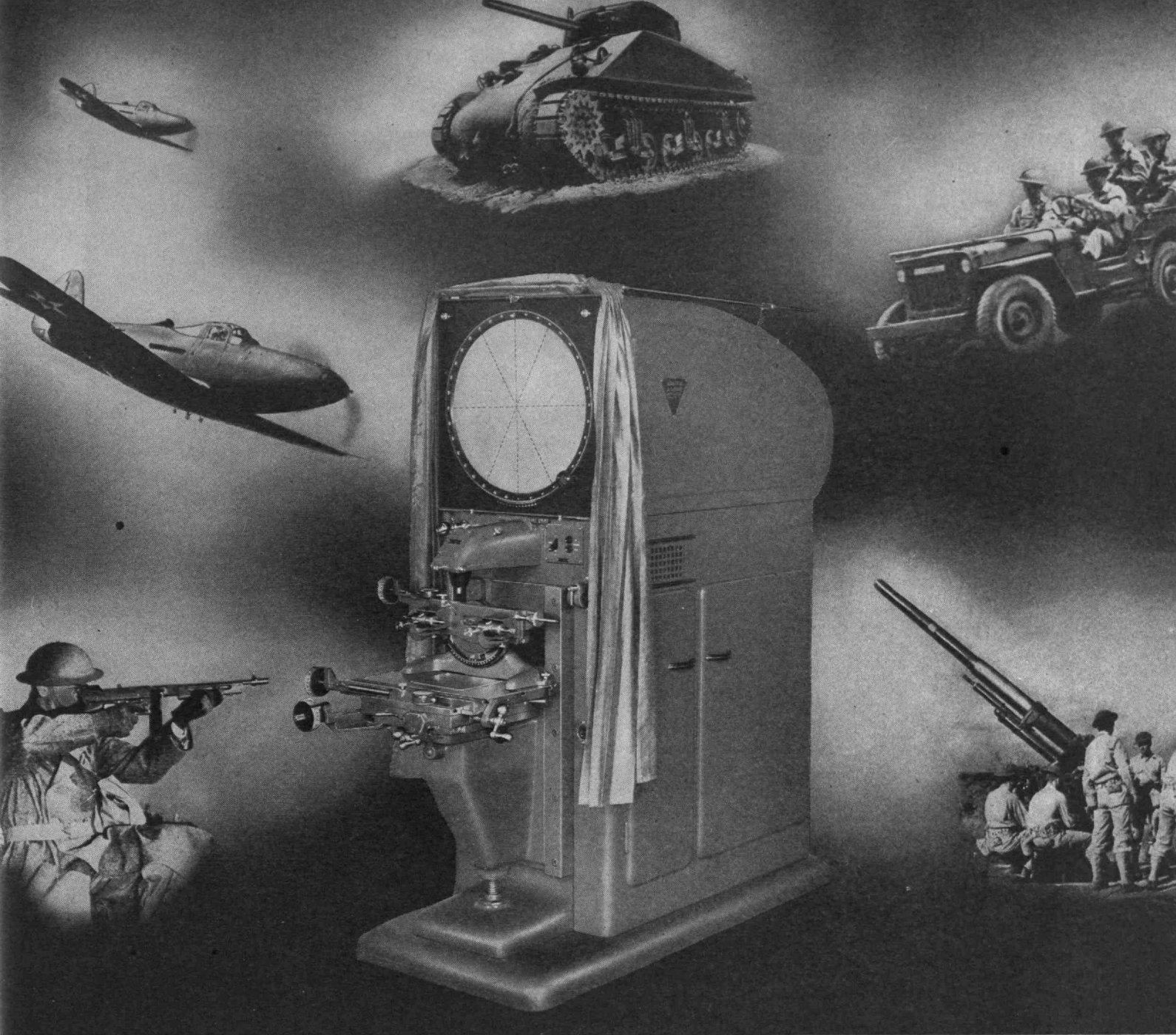
Right now, our prime job is to build up the stockpiles for our fighting men... of both Nylon and natural fiber ropes. But with the return of peace, Plymouth Cordage will be prepared to again serve industries with its full line of cordage products featuring Plymouth Ship Brand Manila Rope and including Sisal Rope and cordage, Binder Twine and the famous line of Plymouth Strong-Tie Tying Twines.



PLYMOUTH

THE ROPE YOU CAN TRUST

PLYMOUTH CORDAGE COMPANY, North Plymouth, Massachusetts
and Welland, Ontario. Division Offices: New York, Chicago, Houston, San Francisco.
Warehouse Stocks: New York, Boston, Philadelphia, Baltimore,
Houston, Chicago, San Francisco.



Bausch & Lomb Contour Measuring Projector

Today Precision *Must* Be Commonplace



American fighting men on our fighting fronts depend upon production line accuracy . . . for ten-thousandths of an inch variation on the production line can mean the difference between a hit or a miss on the battleline.

The Bausch & Lomb Contour Measuring Projector makes such accuracy possible on the fastest moving production lines, because it takes many vital

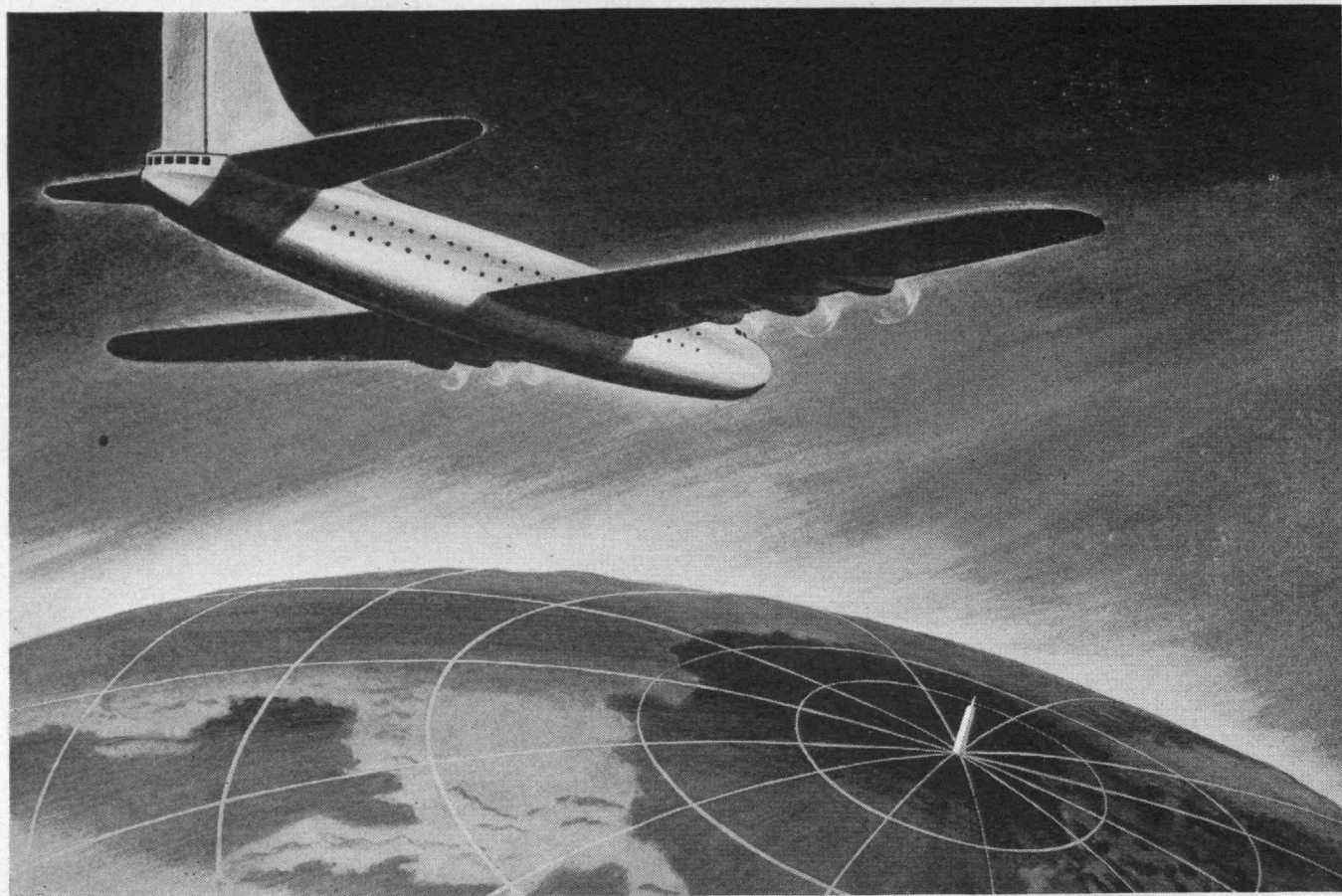
inspection jobs "off the surface plate" and eliminates the tedious, time-consuming computations of the "sine bar." Inspections for accuracy become routine jobs.

Throwing an accurate, sharply defined shadow image of the object under examination on a translucent screen, the B&L Contour Projector permits exact measurements or comparison with an enlarged template drawing at magnifications great enough for easy and accurate dimensioning.

Here again is a Bausch & Lomb peacetime development that serves America at War. The B&L Contour Measuring Projector is helping speed production of fighting tools for our fighting men.

For Bausch & Lomb Instruments essential to Victory—priorities govern delivery schedules.

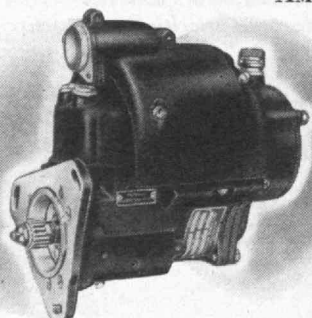
BAUSCH & LOMB
OPTICAL CO. • ROCHESTER, N. Y.
ESTABLISHED 1853



"SO THAT'S THE NORTH POLE!"

Soon the North Pole will need a marker — adequate identification for the post-war passengers on polar routes who'll want to tell their friends they've really seen it. Meanwhile American Bosch sticks to its war jobs — starting vibrators for positive ignition at all temperatures from equator to the arctic circle — aviation magnetos that have helped modern aircraft engines maintain service ceilings of seven miles and more — gasoline injection equipment that saves fuel, steps up pay load, increases engine performance and round trip military range. Whether the future will demand more and more production for military needs or a rapid changeover to transports for polar and other global routes, in research, design and production, American Bosch will continue to serve all branches of the internal combustion industry.

AMERICAN BOSCH CORPORATION • SPRINGFIELD, MASSACHUSETTS



AMERICAN BOSCH

**AVIATION AND AUTOMOTIVE ELECTRICAL PRODUCTS
FUEL INJECTION EQUIPMENT**

"he's writing poetry about
**PARAGON
GEARS!"**

You can't blame a sailor for becoming lyrical about the virtues of Paragon Gears. That happens regularly in both the Navy and Coast Guard. For fighting men know that Paragon Gears give light patrol and combat craft the swift maneuverability that is so necessary to hit—and escape the enemy.

year after year it's
Paragon
REVERSE & REDUCTION GEARS

PARAGON GEAR WORKS, INC., CUSHMAN STREET, TAUNTON, MASS.

**PARAGON
GEARS
MAKE
RISING SONS
RISE**

This little son-of-a-Jap is going up in the world—and right out of it. Paragon Gears help Uncle Sam's fighting men do jobs like this every day and night. Because the majority of lighter naval and Coast Guard craft are Paragon-equipped. Which means swift and sure maneuverability—in action or on patrol.

year after year it's
Paragon
REVERSE & REDUCTION GEARS

PARAGON GEAR WORKS, INC., CUSHMAN ST. TAUNTON, MASS.

idiots!
GET ME INFORMATION
ABOUT PARAGON GEARS!

With typical Nazi tact the espionage chief is ordering his underlings to get facts about Paragon Gears. Of course he won't get them. Yet his eagerness can be readily understood. Because Paragon Gears give Uncle Sam's light naval and Coast Guard craft the same superb service that made them, in peace, standard equipment on over 90% of America's pleasure boats.

year after year it's
Paragon
REVERSE & REDUCTION
GEARS

PARAGON GEAR WORKS, INC., CUSHMAN ST. TAUNTON, MASS.

"Bet She's Got Paragon Gears!"

It's almost a sure thing sailor! For, in peacetime, Paragon Gears are the first choice of America's largest builders of small engines. Uncle Sam, too, knows what he wants, and selects Paragon for light combat craft. Wherever you find light maneuverability, you find Paragon Gears.

year after year it's
Paragon
REVERSE & REDUCTION
GEARS

PARAGON GEAR WORKS, INC., TAUNTON, MASS.

The ability to smile is a by-product of freedom. It is an advantage that Americans enjoy. The Yank cracks a joke as he crouches in a foxhole. The gunner grins as he points his sights at the target. The worker whistles at his lathe and does his job the better for it. Advertising, too, can smile as it tells its story. And when delivered that way, a message is frequently more effective and longer remembered.

Although in light vein, these cartoons contain a serious message: that Paragon Gears contribute directly to the striking power and efficient operation of the nation's naval forces.

PARAGON GEAR WORKS, INC. TAUNTON, MASS.
TRANSMISSIONS FOR MARINE INTERNAL COMBUSTION ENGINES

Richard Wastcoat '00, President & Treasurer



IDEAL FOR SMALL PARTS MILLING

—the productive
Brown & Sharpe
No 000 Plain
Milling Machine

✓ **Rapid advance** of work to cutting position
by power

✓ **Accuracy** of cutting feed engagement
prevents jamming work into cutters

✓ **Steady, uniform feed** gives longer
cutter life and better finish



Brown & Sharpe Mfg. Co.
Providence, R. I., U. S. A.

✓ **Maximum production** on
a wide variety of materials

BROWN & SHARPE

BATH IRON WORKS CORPORATION

*Shipbuilders and
Engineers*

BATH, MAINE

THE TABULAR VIEW

Deus ex Machina? — In his commencement address at the Institute's February graduation exercises, CLAUDE M. FUESS emphasized the need for scientists to nurture their consciousness of the ethical responsibilities of themselves and all educated men. Headmaster of Phillips Academy, scholar, and historian, Dr. Fuess in this address appeared also as philosopher; the thesis which he expounded is apposite to the times, and the essay embodying it (page 327) is one of lasting interest.

Program. — Looking toward the years which will follow the war, and to the unusual necessities which will face all people in the transition from a wartime to a peacetime economy, PAUL G. HOFFMAN, President of the Studebaker Corporation, in an address at the M.I.T. Alumni Association's annual dinner, set forth a plan of action by which American industry can undertake its full share in that process. Chairman of the Committee for Economic Development, Mr. Hoffman spoke from wide acquaintance with the industrial situation of the United States. His address appears on page 329.

Parable. — MAJOR GENERAL SHERMAN MILES, commanding general of the First Service Command, as baccalaureate speaker for Technology in February analyzed the place of armies in the maintenance of the peace of the world and argued powerfully for recognition of their intrinsic inadequacy. Nations, he held, must be unflinching in a realistic approach to the question of aggression, and must recognize that the force of arms alone is not enough to assure against recurrence of present tragedies. General Miles's address (page 331) is an impressive parable of peace.

Something Beyond. — Powerful as it is, trained intelligence alone is insufficient to gird a man to cope successfully with life. The something beyond — an impulse toward the good and toward goodness — was discussed by PRESIDENT KARL T. COMPTON in his valedictory address to graduates which at the February exercises this year, as every year, was a warm and welcome part of the ceremonies even though its task is that of farewell. Dr. Compton's address appears on page 333.

Fair Winds. — The military address at the Institute's February commencement was delivered by REAR ADMIRAL EDWARD L. COCHRANE, chief of the Bureau of Ships of the United States Navy. To Admiral Cochrane, graduate of the Institute in 1920 as well as of the Naval Academy, the occasion was more or less a home-coming, and the circumstances both of place and of time he employed to give special point to the theme of encouragement underlying his address (page 335).

Power Package. — A principal motive in all engineering is the search for power to be applied to do man's work; logically enough, the search for more and more efficient prime movers is unceasing. In this Review (page 325) DAVID O. WOODBURY tells the story of one such search now coming to fulfillment. A frequent contributor to The Review and a member of the Technology Class of 1921, Mr. Woodbury conducts a regular department in *Collier's* dealing with science and engineering.



Suggestions for steel casting design

Information supplied by an Industrial Publication

Not only the quality of steel castings, but their practicability and production cost under ordinary foundry conditions are influenced by design. The following suggestions are offered as an aid to proper design.

1. Whenever possible, all sections should be designed for uniform thickness.
2. Structural design involving abrupt changes in section should be avoided.
3. Sharp corners at adjoining sections should be eliminated whenever possible.
4. When the structure becomes very complicated,

it is better to break it into several components that can be cast separately and assembled by welding or bolting.

5. In designing unfed sections in "L" or "V" shapes, it is suggested that all sharp corners at the junction be replaced by radii so that this section becomes slightly smaller than that of the arms.

6. In designing sections that join to make an "X", it is suggested that two of the arms be offset considerably.

7. In the case of unfed "T" and "X" sections, the radii at the junctions should be relatively small.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING
DATA ON MOLYBDENUM APPLICATIONS.



MOLYBDIC OXIDE, BRIQUETTED OR CANNED •
FERROMOLYBDENUM • "CALCIUM MOLYBDATE"

Climax Molybdenum Company
500 Fifth Avenue • New York City



Machine tools help to make him the
Hope of the world!

Meeet "Flash" Jonesey, champ of the soap box derby. He built that job with his own two hands and his old man's basement tools. . . . He's the great American dream, and the hope of this cockeyed world.

For it's because America raises kids like Jonesey that America is winning this war. Kids who were weaned on mechanical toys, and cut their eyeteeth on tools. Kids who grew up to be the finest fliers and fighters, engineers and builders the world has ever seen. . . . And it's because of millions of kids like Jonesey that America will have a priceless legacy of the world's finest skills, after this war is won.

The responsibility to use those skills wisely and well is one

of the greatest industrial challenges ever to face this nation.

If you are a manufacturer, there is one thing that you can do at once: Have your production men and planners consult now with the engineers of the basic machine tool producers. They can help you in planning ahead the difficult task of reconverting your own skills and machinery to an all-out peacetime production.

One of these engineers is a Bryant man — and his specialized knowledge of internal grinding machinery is important to the manufacture of literally everything that will mean jobs and prosperity after the war . . . that will make America's priceless legacy a new hope for the world.



BRYANT CHUCKING GRINDER COMPANY

SPRINGFIELD
VERMONT, U. S. A.

"PUT IT ON THE BLANCHARD"

CHECK THESE ADVANTAGES OF BLANCHARD GRINDING

Production

★ **Adaptability**

Fixture Saving

Operation Saving

Material Saving

Fine Finish

★ **Flatness**

★ **Close Limits**

★ Especially
valuable on jobs like
the one illustrated.

HERE are two surface grinding problems that came to the Blanchard Engineering Department in one week:

- (1) Grind a hardened steel ring $86\frac{1}{2}$ " in diameter to a tolerance of $\pm .0002$ " for thickness.
- (2) Grind the edges of a steel strip, .005" thick, .125" wide, and 20" long, straight and to a tolerance of $\pm .0005$ ".

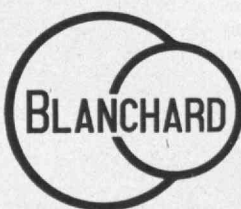
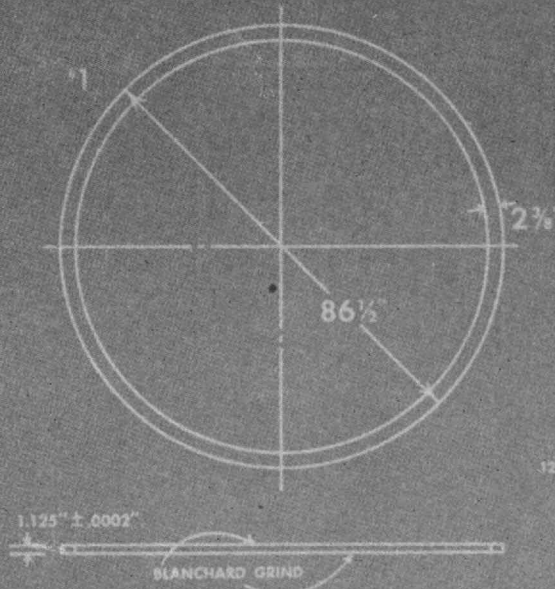
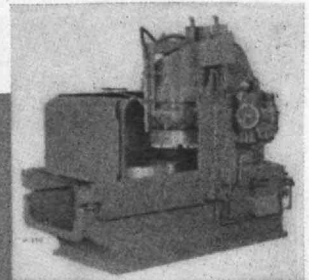
Thirty years' experience in grinding flat surfaces enabled Blanchard Engineers to solve the grinding of both of these jobs, using Blanchard vertical Surface Grinders and Blanchard Grinding Wheels.

If you have work which lies within the range here indicated, you should investigate the possibilities of a Blanchard.

Whether the job is large or small, usual or unusual, Blanchard can show you how to grind it better and faster.

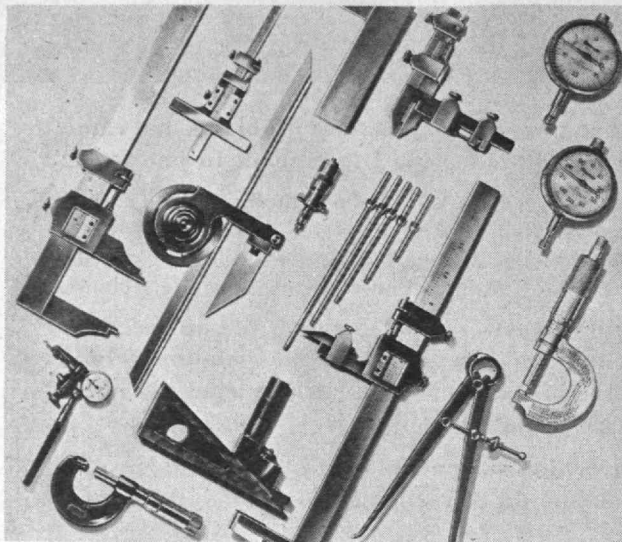
The **BLANCHARD**
MACHINE COMPANY
64 STATE STREET, CAMBRIDGE, MASS.

Grinding Hardened Steel Rings and Edges of Steel Strip on Blanchard Surface Grinders.



Send for your free copy of "Work Done on the Blanchard." This book shows over 100 actual jobs where the Blanchard Principle is earning profits for Blanchard owners.





— the tools to finish the job!

Starrett standards of accuracy and workmanship must be maintained in order that Starrett Tools may contribute the essential speed, precision and confidence to skilled and loyal hands. . . . We must likewise do our utmost to get these tools into those hands that count most heavily toward the successful conclusion of the one big job. . . . To that end your mill supply distributor is performing an invaluable service. You can continue to rely on him for efficient, dependable assistance on all matters of precision tool procurement.



THE L. S. STARRETT CO., Athol, Massachusetts, U. S. A.

WORLD'S GREATEST TOOLMAKERS

STARRETT

PRECISION TOOLS • DIAL INDICATORS • GROUND FLAT STOCK
HACKSAWS • METAL CUTTING BANDSAWS • STEEL TAPES



**Take Hold
of the
FUTURE**

When you shoulder your reconversion responsibility, use Diefendorf as your source of fine, precision cut gears. Enlarged and improved facilities—a wealth of experience earned in years of pioneering non-metallic gears and special metallic gears make Diefendorf the right place to come with your gear problems.

**DIEFENDORF
GEAR CORP.**

D. W. Diefendorf '30, President
SYRACUSE, NEW YORK

diefendorf
★★★★★**GEARS**

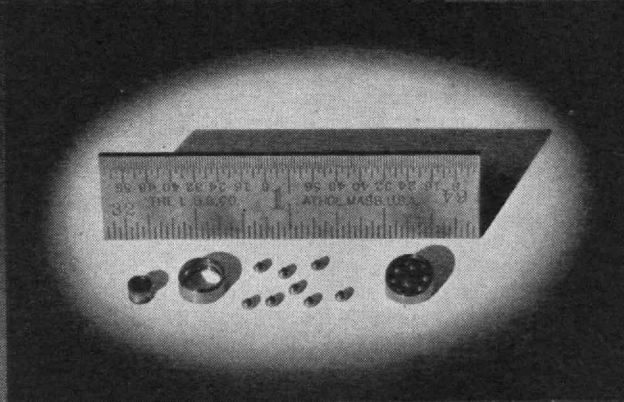
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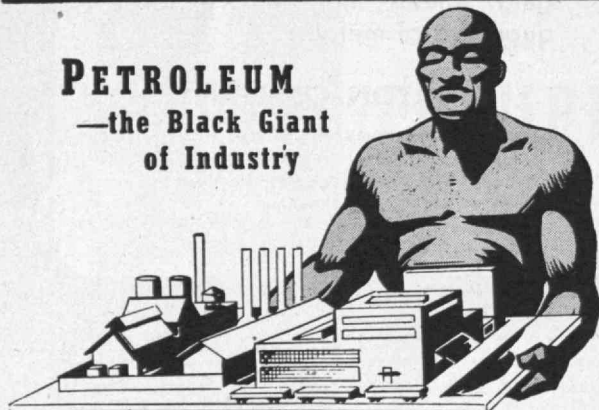


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Alfred T. Glassett, '20, Vice President

UNION CARBIDE REPORTS

first full-year's production of

BUTADIENE

for the Government's Synthetic Rubber Program

(INSTITUTE, W. VA. PLANT)



Night view of the immense butadiene plant at Institute, W. Va.

A LITTLE OVER A YEAR AGO* the first tank car of butadiene was shipped from the Government's large integrated rubber project at Institute, W. Va. This historic shipment came from the immense butadiene plant which was designed and built by CARBIDE AND CARBON CHEMICALS CORPORATION for the Government's Defense Plant Corporation—and is being operated by this Unit of UCC, for the Rubber Reserve Company.

FIRST YEAR'S PRODUCTION OVER THE RATED CAPACITY— that is the record of this huge 80,000-ton-per-year plant during its first twelve months! This has been accomplished in spite of the many inherent problems that had to be solved in starting a wholly new project of this magnitude.

Over 8/10 of a short ton of butadiene is required to make about one long ton of Buna S type synthetic rubber. Butadiene from this plant during the past year has provided more than 90,000 long tons of synthetic rubber for the Nation's requirements, both military and essential civilian. The delivery of this all-important ingredient also has made possible early production of synthetic rubber under the Government's program.

*The first tank carload of butadiene from Institute was shipped on February 18, 1943—less than one month after Unit No. 1 of the four large butadiene-producing units had started operating. Subsequently, Unit No. 2. started producing in March, Unit No. 3 in April, and Unit No. 4 on May 25, 1943.

NOW HUGE BUTADIENE PRODUCER—although originally designed to produce 80,000 tons annual capacity, the Institute plant is now delivering butadiene at a rate of more than 100,000 tons per year. An identical plant using Carbide's process was put into operation by the Koppers United Company in September, 1943, at Kobuta, near Pittsburgh, Pa.

OVER 75% OF THE TOTAL PRODUCTION OF BUTADIENE for the Government's synthetic rubber program in 1943 came from the alcohol process developed by CARBIDE AND CARBON CHEMICALS CORPORATION.


In addition to the plant at Institute, Carbide made available plans for the large plant at Kobuta, which was built and is being operated for the Government by Koppers United Company.

CARBIDE AND CARBON CHEMICALS CORPORATION also has designed and built for the Defense Plant Corporation, and is operating for the Rubber Reserve Company, another large butadiene plant at Louisville, Ky.

Business men, technicians, teachers, and others are invited to send for the book P-4 "Butadiene and Styrene for Buna S Synthetic Rubber from Grain Alcohol," which explains what these plants do, and what their place is in the Government's rubber program.

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Carbon Chemicals Corporation

The material herein has been reviewed and passed by the Office of Rubber Director, the Rubber Reserve Company, the Defense Plant Corporation, and the War Department.

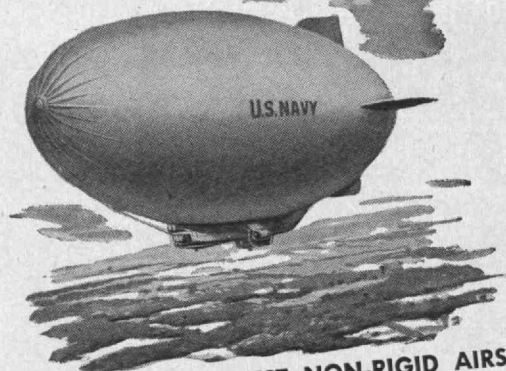
Trail Blazing in the Skies

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FASTER STRETCH-BENDING OF AIRCRAFT PARTS is made possible by the ROTO-STRETCHER, a new development of the Goodyear Aircraft Corporation. This machine forms strips, extrusions and bent-up sections of any cross-sectional configuration into smooth contours of predetermined shape with minimum time and labor. It leaves no wrinkles, eliminates costly hand-work. Bends are set permanently; springback is negligible, resulting in practically 100% uniformity. Parts of extremely small radii are readily formed and contours up to 360° are possible. It's a major contribution to aircraft mass production.

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THE WORLD'S LARGEST NON-RIGID AIRSHIP—the Navy's new M-1—is a product of Goodyear's thirty years of pioneering in aeronautics. Long experience and practice in the improvement of aircraft design and construction methods have enabled Goodyear Aircraft to produce large numbers of patrol airships for the wartime emergency. And the record of Goodyear-built airships in safeguarding convoys without a single loss from submarine attacks attests the effectiveness of the airship, while their intensive operations attest the soundness of Goodyear construction.



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WITH WAR BONDS**

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4. By building complete airplanes and airships.
5. By extending the facilities of Goodyear Research to aid the solution of any design or engineering problem.

Goodyear
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THE TECHNOLOGY REVIEW

TITLE REGISTERED U. S. PATENT OFFICE

EDITED

AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY



Fred G. Korth

This Martian uses a shot blast to clean steel castings.

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From a photograph for the State of California Department of Public Works

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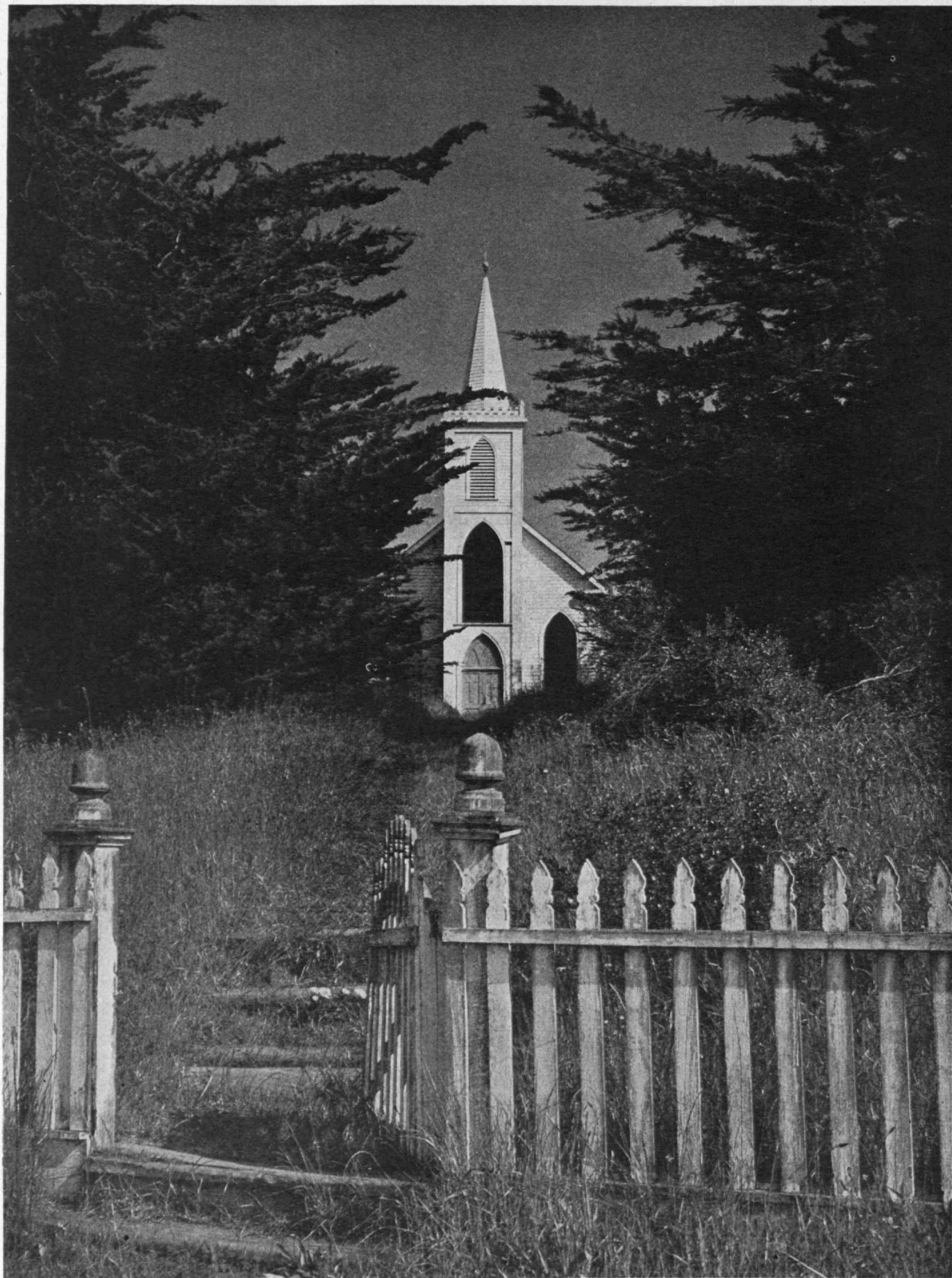
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Raymond B. Collier, '20

FOR EASTER

A country church on the West Coast

(322)

THE TECHNOLOGY REVIEW

Vol. 46, No. 6



April, 1944

The Trend of Affairs

More Ore

FIFTEEN billion tons of iron ore suitable for the manufacture of high-grade steel, it is estimated, are contained in the Brazilian state of Minas Geraes, centering on Caue Peak. This important new source of ore for the war plants of the United Nations will be brought into production during this year, and for the next three years the annual output of one and a half million tons of ore will be divided between Great Britain and the United States.

Caue Peak, the heart of the world's largest iron ore deposit, rises 4,500 feet above sea level. Since no overburden of earth covers the ore mass here, open-pit mining will begin near the top of the mountain itself. Direct loading from electric shovels into trucks will start the ore on a three-quarter-mile ride to the processing plant down the mountain. From the first crusher at the plant, six conveyer belts running in tandem will move the ore more than a mile to secondary crushers, whence, after further processing, it will go to hoppers which load it into railroad cars. For the 350-mile rail jump from the mine, at Itabira, to the Atlantic port of Victoria, new rail is being laid and existing railroad bridges are being strengthened.

The United States, relying principally on the Lake Superior region for iron ore, has been importing more than 1,000,000 tons annually from Chile and some 800,000 from Venezuela. Availability of the Brazilian supply will thus appreciably increase trade relations with South America. Prediction that by 1950 the high-grade ores of the Lake Superior region may be exhausted, leaving only ores which necessitate far more extensive mining operations, is further basis for satisfaction over the development of Minas Geraes' mighty center. Engineering and industrial firms in the United States have had a leading role in the design and development of installations for the opening up of the Brazilian deposits. A 45-mile 69-kilovolt high transmission line from an adjacent hydro-

electric station has been required to tap one source of power. Another source is a steam and Diesel generating plant of 1,000-horsepower capacity, already in operation about 35 miles distant. Transformers and other equipment in each of the stations feeding power to mine operations are being provided by firms in the United States.

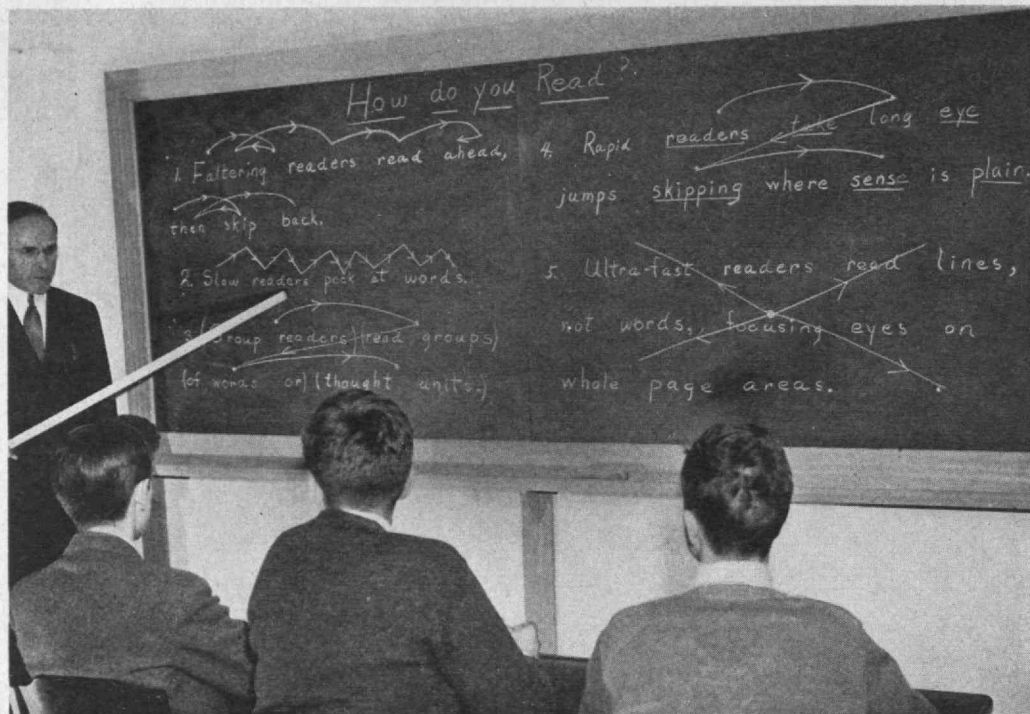
Reintroduction

WHEN Charles Haskins Townsend died this winter, he had earned the unique distinction of having saved three forms of life from man the destroyer. An expert on the fur seals of the Pribilof Islands, he was a member and guiding spirit of the commission which in 1896 drew up the treaty that assured the continued existence of these mammals. Seeing that the giant 200-pound Galápagos turtles were being reduced to alarmingly low numbers, he was instrumental in establishing colonies of them in appropriate environments in Hawaii, California, and the Gulf of Mexico. Townsend was also an important factor in re-establishing the reindeer in Alaska with stock imported from Siberia after the native breed had been given the *coup de grâce* by Eskimos and white hunters armed with rifles.

Alaska has recently been the scene of another reintroduction in the same tradition, this time of the musk ox, an animal which disappeared from that region about a century ago. Able to hold its own against its two most ancient enemies — wolves and primitive man — it had succumbed to gunpowder. The same cause had substantially the same effect over much of the area the musk ox once occupied in northern Canada, and although Canada maintains a sanctuary of 15,000 square miles for them, no surplus musk oxen were available on the North American continent when Congress, in 1930, voted an appropriation to return the musk ox to its Alaskan habitat.

The annual report of the Smithsonian Institution for 1942 relates how a Norwegian with experience in capturing these animals was given a contract to round up a

Sixth-grade ability in reading is the high point for some 15,000,000 Americans, according to authorities of the Carteret School for boys at West Orange, N. J., where a reading clinic for scientific diagnosis of reading habits was established a year ago. One instrument used, the ophthalmograph, photographs eye movements and groups readers in the five classes here typified on the blackboard: 1. those who read ahead and then skip back to recover the full meaning, whose rate is only 150 to 200 words a minute; 2. the slow laborious readers who peck at each word singly and lose the sense of one sentence before they have read another; 3. those who comprehend word groups, or thought units, who rate from 350 to 450 words a minute; 4. rapid readers who take long eye jumps, skipping where the sense is plain; 5. ultrafast readers who focus on whole page areas, reading lines rather than words, at a rate of 500 to 900 words a minute.



1. those who read ahead and then skip back to recover the full meaning, whose rate is only 150 to 200 words a minute; 2. the slow laborious readers who peck at each word singly and lose the sense of one sentence before they have read another; 3. those who comprehend word groups, or thought units, who rate from 350 to 450 words a minute; 4. rapid readers who take long eye jumps, skipping where the sense is plain; 5. ultrafast readers who focus on whole page areas, reading lines rather than words, at a rate of 500 to 900 words a minute.

herd in Greenland. That was the start of a 14,000-mile trip for 34 musk oxen, which took them to Bergen (Norway), New York, Seattle, and then to College, near Fairbanks, Alaska. Here they were released into a 7,500-acre pasture, part of the Biological Survey's co-operative reindeer experiment station. The herd soon indicated that it would prosper in its new surroundings, and in 1935 two bulls and two cows were released on Nunivak Island, 25 miles off the Alaskan mainland. Completely free of all large predators like wolves and bears and containing nearly a million acres of lush grazing land, this island sounds like a musk ox's Garden of Eden. A year later the remainder of the herd was transported to the island. At last count more than 60 animals were there, and prospects were good that this herd could eventually restock Alaska.

Highball

RAILROAD WORKERS of the country set a high mark in efficiency during the tremendous pressure imposed by wartime demands during 1943 and of course increasing at present. The *Survey of Current Business* issued by the Bureau of Foreign and Domestic Commerce points out that comparison of major indicators of equipment utilization for 1939 and 1943 shows increases of 26 per cent in average load per freight car, 144 per cent in average number of passengers per car, and 8 per cent in number of freight cars per train. The average haul, moreover, increased by 34 per cent during the four-year period.

The productivity of railroad labor is the best standard for measuring the cumulative effect of all these factors, the *Survey* observes. The total output of railroads—that is, the volume of transportation measured by weighted index of net ton-miles and passenger-miles—increased 132 per cent from 1939 to 1943. An increase of

only 54 per cent in railway man-hours achieved this increase in performance.

Traffic volume per man-hour appears to have reached a peak, and since ton-mile requirements for 1944 are expected to be 5 per cent higher than in 1943 and passenger-mile requirements 15 per cent higher, continued difficulties confront the railroads.

What to Put It in

A HIGH volume of manufacture necessarily creates extra demands for containers to hold products both during shipment and in storage awaiting sale or use. When the goods manufactured are urgently needed in faraway locations—as is of course true of the great bulk of goods coming out of American industrial plants today in answer to the demands of war—this condition is intensified, because shipping containers for war materials must withstand rougher usage than their peacetime counterparts.

The high production levels maintained in the container industry during 1943 are being held to this year, but demand for all types of new containers exceeds the available supply and bids fair to continue doing so. Wooden boxes and crating, according to every indication, will be major claimants on the lumber supply in 1944. Controlling factors for future output are man power and lumber, reserves of the latter being estimated as far below normal, possibly as low as 40 per cent of normal. The lack of woodsmen to get out pulp, let alone lumber, has been brought home long before now to every reader of newspapers and magazines.

The good work of the United States Forest Products Laboratory, which through developing packaging specifications and through training inspectors produced a saving of 500,000 tons of shipping space in 15 months, set a mark for all concerned with the handling of goods

to emulate. The specifications involved saving a fraction of an inch here, an ounce there. The total saved, however, reaches enormous proportions when it is considered that 45 per cent, or 15,000,000,000 board feet, of our entire 1943 lumber production went into boxing, crating, and allied uses, half of it strictly military.

The situation of fiber shipping containers, for reasons closely related to those affecting wooden boxing and crating, may be expected to be critical. Production of fiberboard for containers is running heavily behind consumption. Lack of raw materials and continuation of high demand are the crux of the trouble. The glass container industry, hampered by short supply of soda ash, the second largest ingredient used, nevertheless foresees 1944 production to equal that of 1943. About the same amount of tin plate will be available for essential containers in 1944, it is estimated, as in 1943. Higher food production this year is anticipated, but easing of the steel situation is expected to permit manufacture of additional quantities of cans to hold it.

All in all, the question of what to put it in promises to be not among the least of those to be encountered during the year.

Gas Engine Prodigy

BY DAVID O. WOODBURY

THE ingenuity and persistence of Harry P. Sparkes, racing car enthusiast and meter engineer, have lately solved one of the toughest of gas engine problems — what to do with the excess heat of combustion which cannot be absorbed by the crankshaft as power. His newly developed copper-jacket air-cooling system is already at work in the war and promises spectacular increases in the operating life of gas engines for the future.

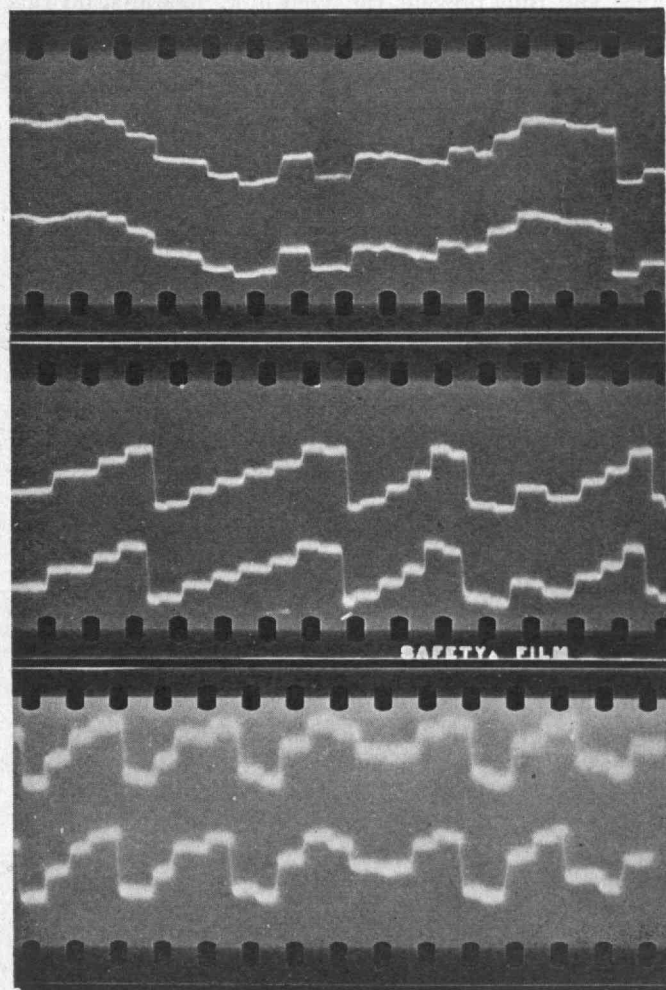
Some years ago, while following the auto races closely, Sparkes began to wonder why racer engines wore out so fast. He had observed that automotive power plants, even those built for light duty in passenger cars, were not really satisfactory as precision jobs until they had been rebored and fitted with oversized pistons and rings. The reason, he found, was that cylinder castings on a new engine soon got out of line. Until they had gone through a certain period of aging, they could not be held to the precise dimensions required of high-speed reciprocating machinery. After the reboring job, they seemed to behave better and were then able to do their real work. But rather than stand the expense of this rebuilding, most people threw the engines away and got new ones.

Sparkes built himself a racing engine and set it up in the shop for close study. Puzzling over the warped valves and misaligned bearings that soon developed, he decided that the whole trouble was faulty heat transfer from the hot region inside the cylinders to the cool one in the water jackets. Internal temperatures ran close to 2,000 degrees Fahrenheit, while the highest permissible in the jackets was under 250 degrees. No piece of cylinder steel, he realized, could stand such a temperature gradient unless the heat transfer was absolutely even and smooth. Conventional jacket design made this impossible.

Sparkes found that uneven heat flow resulted in a very interesting behavior of the steel. First the internal metal would expand, dragging the outer, cooler metal with

it in what amounted to a cold draw. When the engine was stopped, the inside would attempt to contract, be prevented by the expanded outer portion, and so become cold-drawn also. Result: an actual growth in the dimensions of the cylinder, progressive over the life of the engine. Since this action was not uniform, one side of a cylinder would grow more than the other, thus throwing the whole machine out of line. The trouble was worst where cylinders and heads were cast in one piece, as in small two-cycle engines for outboard and generator drives.

Sparkes saw a solution for the difficulty — to make the cylinder walls bimetallic, with the outer portions of higher heat conductivity than the inner ones. Copper jackets immediately suggested themselves. These had been tried before, without success, but the reason for failure was obvious. Copper fins had been welded to steel cylinder bodies. This was not the solution to the problem, for it removed the heat in circular zones and forced



Photographs of the eye movements of three students as recorded in the Carteret School reading clinic. At the top is ophthalmographic tracing of the work of a comparatively poor reader. His reading rate was 125 words a minute, and his rate of fixations (the number of times his eyes stopped to pick out words or portions of words) was 85 per 100 words. He regressed (retraced his words) 30 times per 100 words. The center film is that of a student with a reading rate of 453 words a minute, fixation rate of 64 per 100 words, and regressions of 10 per 100. At the bottom is the record of a rapid reader, whose rate is 632 words a minute, with 44 fixations and only six regressions per 100 words. The fastest reader also scored highest in comprehension, a finding which indicates that it is no accident that honor students are generally fast readers.

it to pile up in the contiguous zones between fins. His own idea was to weld a solid copper sleeve intimately to the steel — in fact, to make the cylinders essentially of copper with an inner steel face to take the wear of the piston. Once the internal heat was evenly distributed into this copper “blanket,” it could be removed either by means of water or by means of radial fins without creating zones.

There was no doubt that copper was the right material. The only other metal worth considering was aluminum, with about half the heat conductivity. Though aluminum was standard for cylinder heads and cooling jackets on airplane engines, it was not ideal. There were many instances of cylinder heads actually bursting under the stresses of uneven expansion around the valve casings. The inventor determined to try copper.

The greatest obstacle in the way of success was the difficulty of obtaining a perfect bond between copper and steel, such a bond as would interpose no heat resistance and thus prevent the even flow. Research on this problem occupied Sparkes for several years. Putting in nights and week ends in his cellar laboratory at home, he finally worked out a method of bonding the two metals. The process was patented but remains a secret for the present.

His first experimental engine recently went on test in the small factory he has built for the purpose in Newark, N. J. The little machine has already turned in an extraordinary performance. The usual small engine, especially when running on high-octane gasoline, quickly develops “zones” on the cylinder walls — rings of larger diameter caused by excessive wear. These soon result in broken rings, freezing, wrist-pin bearing trouble, and just plain breakdown. So far the Sparkes engine has shown none of these diseases, though it has been run at double its normal load for many hours at a time. The performance has been so good that the Army has contracted for the production of a number of these little engines for utilization in special duty.

Supplying his engines for war use gives Harry Sparkes plenty to keep him busy, but he is already thinking ahead to great things for the future. By the use of welded copper jackets, he expects to be able to cool standard automobile engines by air, or, as he puts it, “eliminate water cooling entirely by installing the radiator on the engine itself.” This kind of air cooling, he believes, will permit a complete new design of engine — a pancake type operating vertically, mounted on the front of the dashboard, taking up a fraction of the space required for present engines, and operating at temperatures now quite impossible. He expects this will achieve 2,000 hours of normal life without overhaul — the equivalent of about 50,000 miles of travel.

Another interesting promise is a compact little engine-generator set weighing no more than 30 pounds. It will be used by campers and fishermen to furnish power for an electric-motor-driven propeller in small boats, and can be carried ashore and set up to generate lights and current for camp cooking.

A plan is even under way to solve a knotty problem of dissipating heat in brake shoes on trucks, on busses, and especially on airplanes. Cast-iron shoes cannot stand sudden heat loads and are constantly cracking and dropping off. The copper-jacket brake shoe has shown experimentally that it will never wear out.

To Oust the Gremlins

HUMOROUSLY inclined advertising men have made much in recent months of the fanciful idea of the gremlin — the imagined sprite, sometimes of good, more often of evil intent, conjured up by aviators in this war. The gremlin, in spite of cunning copywriters, is a serious matter; it has perhaps been a disservice to describe and depict him as a natural and accustomed companion of pilot and navigator. When he rides the air, he does so as a decidedly dangerous and unwanted passenger. Far from being an amiable creation of actively amusing minds, the gremlin — actually the product of the unusual psychological stresses imposed by flight and readiness for flight — is a problem of serious magnitude.

That science so recognizes him is clear in a survey of the work done by psychologists and other specialists in helping to keep military fliers at maximum effectiveness. Walter R. Miles, professor of psychology at Yale University, active in the military utilization of psychology through committees of the American Psychological Association, the Civil Aeronautics Authority, and the Office of Scientific Research and Development, in a recent Sigma Xi lecture reviewed work done in the past and the program at present in force, emphasizing that results demonstrably effective in the present war may be expected to be useful also in the time of peace to follow.

“The fighting airplane of today is a structure and a weapon of enormous complexity,” Dr. Miles said. “Its adequacy for performance rests, of course, first of all on its mechanical completeness and perfection. But the competence of the flying personnel in routine and in unexpected situations decides its ultimate effectiveness. The men in the plane, their physique, ability, training, skill, experience, and courage constitute the all-important element in combat aviation.”

Maintaining operational efficiency in fighter pilots and air-crew men, Dr. Miles declared, involves many broad psychological considerations. Clinical methods at present are being used for the study of many of these; in wartime, interest naturally centers on the maintenance of efficiency and morale of men in active service and on the care and treatment of the shocked and disabled. Strictly planned scientific research hence is not at present readily feasible. The conditions under which pilots operate are not favorable for exact study; the 200 hours or so of combat flying which a fighter pilot may do before assignment to other operations may be spread over a period of some 2,000 hours of duty. The psychological stresses presented by long stretches of readiness, without combat service, may be severe. The so-called gremlins, for instance, first made their appearance under the kind of stresses imposed by long-range photographic reconnaissance. In all such problems as these, the practical psychological skill of the flight surgeon in evaluating stress developed from readiness, from combat, or from both contributes greatly to the efficiency of the air force.

Psychology was first called into the service of military aviation in World War I, Dr. Miles explained. In the early years after the success of the Wright brothers at Kitty Hawk, imagination, daring, and luck were the principal determinants in the selection of fliers themselves, for major attention necessarily was placed on the overcoming of mechanical limitations in the planes themselves. When, by 1916, (Continued on page 386)

Man and His Machines

*The Failures of Our Civilization Have Been Moral, Not Mechanical;
Hence the Education and Practice of the Scientist
Should Be More Than Scientific*

BY CLAUDE M. FUESS

COMMENCEMENT ADDRESS

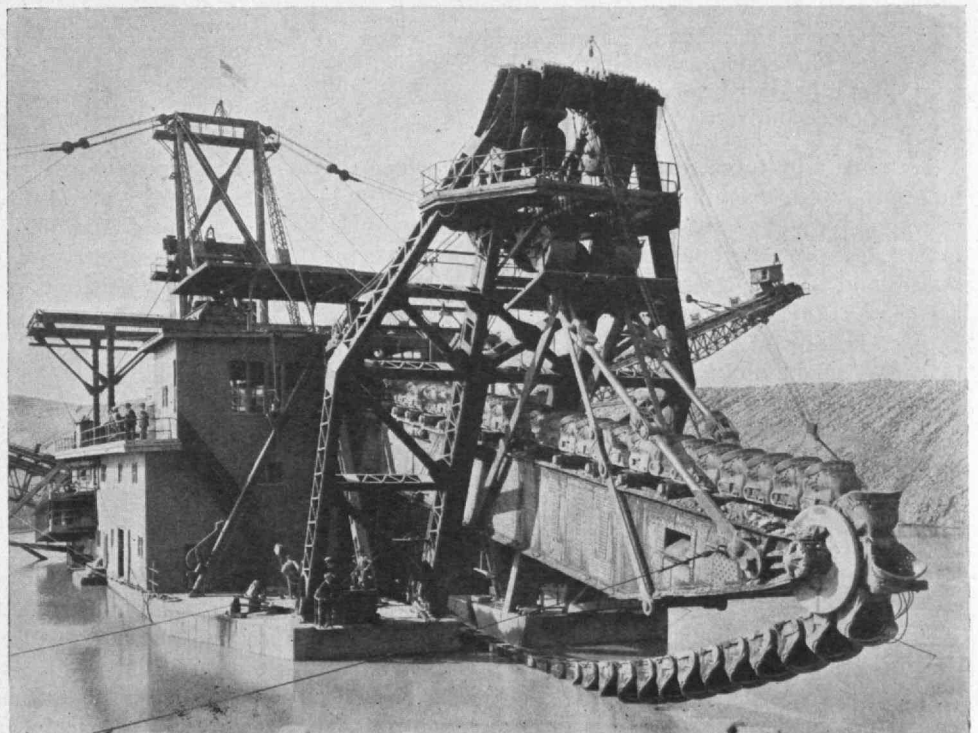
IT is a whimsical irony which has made me a counselor to you members of the graduating class on this significant morning in your careers; for, without meaning to be boastful, I know as little about science and scientific matters as anyone in this hall. When the master of Balliol, in Oxford, was asked about the examinations for admission to that ancient institution, he smiled and said, "They are an impious attempt to fathom the depths of human ignorance." That is what I have always felt, quite frankly, about tests in mathematics and physics. I realize that this weakness in a sense disqualifies me as an adviser, and therefore I am more than ordinarily embarrassed. But I propose to address you not as scientists but as men, not primarily as engineers but as citizens; and so doing, I may secure the tolerance which strictly I do not deserve.

In the 1920's a visiting Englishman and I strolled for an hour or two under a July moon while hundreds of Fords and Chevrolets were whizzing along the parallel highway. Inevitably we began discussing whether the motorcar had brought more good or more harm to the human race. The arguments were the familiar ones, and I found myself, as a conservative Yankee, defending the automobile with unprecedented vigor. This irritated my guest, who finally broke out, "Why, look here, some day these damned engines will overwhelm their makers. We're like Frankenstein, who created a monster he couldn't control. Already we're dominated by machines and can't escape their baleful influence. A modern man can't get along without his telephone, his watch, his typewriter, his radio, to say nothing of his automobile. They're all a part of him. Take them away and he'd be helpless. Machines rule our world — and rule it without any discretion or pity, without any moral sense!"

As my friend railed on, I remembered Samuel Butler's famous story, *Erewhon*, in which an Australian explorer discovered the amazing country of the

Erewhonians, where the people at an earlier epoch had developed an astounding mechanical proficiency. At that period a learned Erewhonian professor in some institute of technology published a treatise declaring that machines were destined ultimately to supplant human beings. Whereupon a political party arose, calling themselves the "anti-machinists," who felt, as one of their leaders declared, that they could not "calculate on any corresponding advance in man's intellectual or physical powers which would be a set-off against the far greater development which seems in store for the machines." A bloodthirsty civil war ensued, won by the anti-machinists, who treated their opponents with ruthless severity, burned all manuals of physics and all engineers' workshops, and forbade any further inventions under pain of the direst punishment. At the time when the explorer arrived, all dissension in Erewhon on this subject had long cooled. He did find, however, a Museum of Old Machines, where he saw in cases a rusted cylinder and piston, a broken flywheel, a decrepit railroad carriage, and several dismantled clocks. The country had had its Machine Age, had found it unsatisfactory, and had been glad to revert to a less disturbing daily routine.

All this belongs, of course, in the realm of fantasy. Plenty of writers have decried our so-called progress. I recall the remark of Ralph Adams Cram that Spain is the



*Gargantuan among man's
machines, the gold dredge
must be recognized as a tool
dependent for worthy use
upon human intelligence
and will.*

Yuba Manufacturing Company

most highly civilized of contemporary nations because it is the least dependent on machinery. Some of you may recollect an observation of the Celtic philosopher, Mr. Dooley, in his talk on "Machinery": "We live," says he, "in an age iv wonders. Niver before in th' histry iv th' wurruuld has such pro-gress been made. . . . Look at us today. I go by Casey's house tonight and there it is, a fine storey-an'-a-half frame house with Casey settin' on th' dure shtep dhrinkin' out iv a pail. I go by Casey's house tomorrah an' it's a hole in th' ground! I rayturn to Casey's house on Thursdah an' it's a fifty-eight storey buildin' with a morgedge onto it, an' they're thinkin' iv takin' it down an' replacin' it with a modhren sstructure."

But, in spite of this satire, we are not likely to give up printing presses and tractors and locomotives with all that they mean to us. Certainly the last place where a speaker needs to defend the Machine Age is before this audience. You graduates of Technology have been spending your days among machines — machines which smash atoms, machines which can transport men through the air and under water, machines which respond to stimuli and do everything but think. A metropolis like Boston could not exist a week without them. They have made us what we are.

But our machines, however marvelously conceived and built, still cannot think. Behind every one of them is a human mind. The airplane may bring food and water to people marooned on a desert isle or it may drop bombs on marines in a trench. Which it will do depends on the pilot who operates it. Like every village loafer, I have watched a steam shovel functioning as if it were merely an arm lengthened and stretched into space, groping like a sensitive hand. Yet this machine cannot reach decisions. Always back in the little wooden hut surrounded by mysterious levers is an operator who furnishes the intelligence, deciding what area shall be excavated next. The marvels of science grow more startling year by year, but not yet can the machine make its own choice of good or evil. Perhaps you recall the caustic lines of Bertolt Brecht in his poem, "Warning to Nazis":

General, your tank is a strong machine;
It can break down a wood, crush a hundred men.
But it has one drawback;
It needs a driver.

We must admit, too, that with all the good which they have produced, machines improperly guided may be inconceivably malignant. Even the steam shovel, if it moves unexpectedly north instead of east, may overturn houses and tear up streets. A drunken sophomore at the wheel of a Packard may leave devastation in his wake. I need not dwell on the destructive functions which machines are having in this most diabolic of all wars — on the catastrophic damage caused by Flying Fortresses; on the gases which, if released, may wipe out the population of entire cities; on the new explosive which, we are blandly informed, destroys every living thing within a 12-mile range. If this is the supreme goal of science, we have progressed very little since the days of Pericles and Cato. We have gained in efficiency, but we have lost our soul.

Henry J. Taylor in his remarkable book, *Men in Motion*, quotes Sir Arthur Tedder, then commander of the Royal Air Force in North Africa, as saying: "Modern man is not modern at all. He is just, momentarily, far

ahead of himself. What we are really witnessing all over the world is the lopsided spectacle of phenomenal technological improvement occurring within thirty years of incredibly bad government." And Taylor makes the additional comment: "The original mistake occurred when our scientific explorers, our inventors and engineers, supplied a new world in the mechanistic network and forgot they were not supplying new men or new statesmen." The fact is that it has not been sufficient just to construct the machines. They must be properly controlled. With all their amazing potentialities, they are still only tools — tools which someone must direct and manage. Human brain cells must eventually decide whether machines will kill or create. Is it not possible to produce a change in man himself comparable with the miracles of science?

The scientist himself has no right to disclaim all responsibility. He must know the composition of his chemical product or the structure of his engine; that goes without saying. If he discovers insulin, or bridges an impassable gorge, he is presumably helping his neighbors, near and remote. Furthermore the average scientist, to his enduring credit, goes at his business of research without any consideration of personal motives. He is after proof, and pursues the evidence even though it leads him into an intellectual quagmire. If we could only transfer to other fields of activity the disinterestedness, the scrupulosity, the burning passion for truth which the scientist shows within the limits of his profession, many of us would be less pessimistic about a postwar world. I beg you to believe that this tribute is sincere and well deserved.

But the failures of our civilization, as Henry M. Wriston has pointed out, have been moral, not mechanical. It is not machines which have made this war, but the inability of man to understand and get along with those around him. Nor will the basic issue, in the long run, be settled by machines. Bombs could not conquer England. The victory will be achieved because one side or the other lacks the spiritual stamina to carry on. We shall, of course, win the race of the laboratories, but it will be a breakdown in morale which will cause the Axis collapse.

Consequently, I suggest that the education and practice of a scientist should be more than scientific, that it should include a thorough study of human motives and desires, of historical trends and failures, of basic moral issues, past and present, of Herbert Spencer and Sigmund Freud and William James. The scientist should develop a constant sense of responsibility for what is going on around him in the world, away from his blueprints and test tubes. We can safely trust scientists to do their tasks well in the spacious buildings on the bank of the Charles. But we need their help also in the broader field of human society.

The jurist, the economist, the theologian, the sociologist, the legislator, the teacher — all these have, I think, made colossal blunders during the last quarter of a century. With regret I confess that the teacher has failed to bring home to boys and girls their responsibility to their communities. Just now we are not fully united as a nation simply because of the various forms of intolerance, selfishness, bigotry, and race and class hatred which seem to be raising their sinister heads. What have these to do with science? Only that it (Continued on page 354)

Winning the Peace

Avoidance of Mass Unemployment or Mass Government Employment Is the Minimum Requirement; Numerous Fallacies Must Be Eradicated from Postwar Planning

BY PAUL G. HOFFMAN
ALUMNI DAY BANQUET ADDRESS

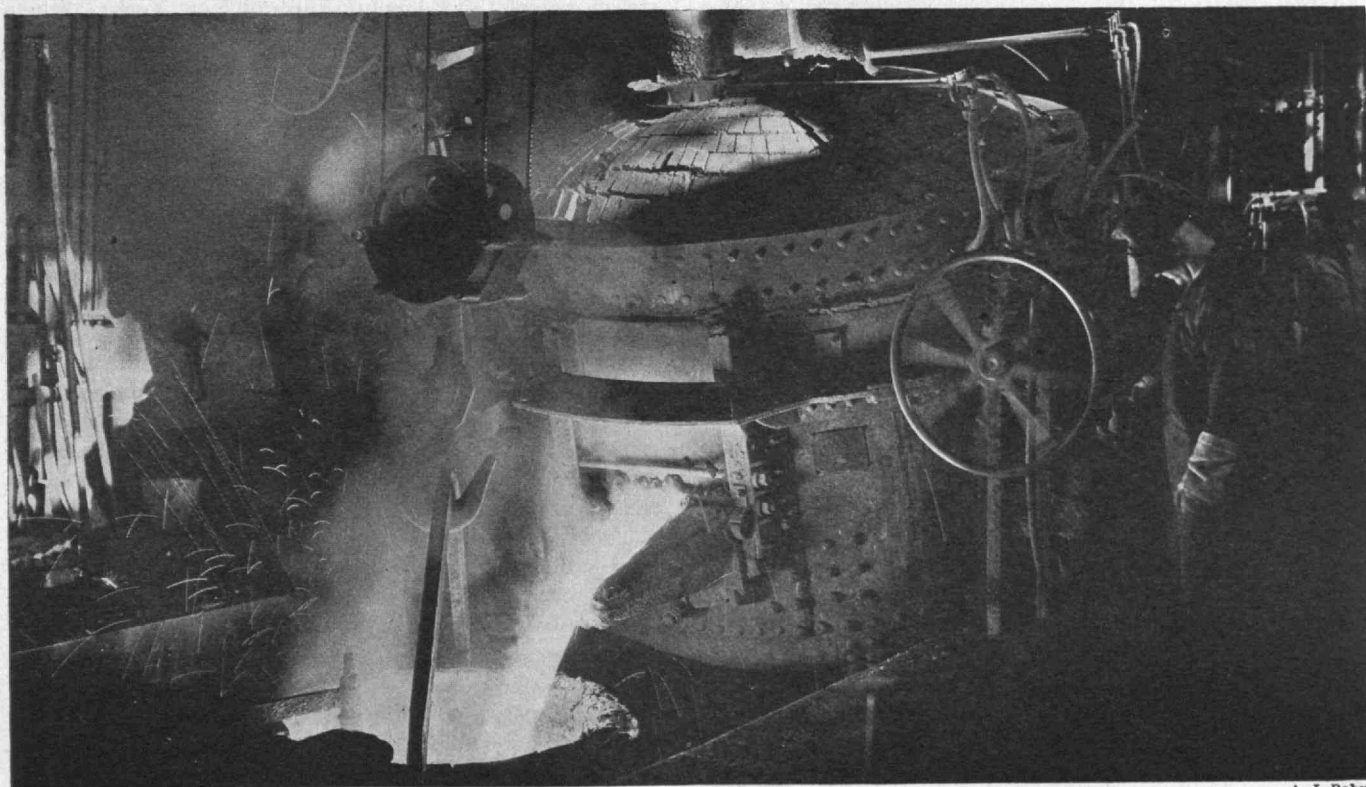
I CONSIDER it a great privilege to address the Technology Alumni Banquet. It was with particular pleasure that I accepted the invitation because it offers me an opportunity to tell about some of the aims of the Committee for Economic Development to a group of men who are making an important contribution toward winning the war and who can make an equally significant contribution toward winning the peace.

Because my subject deals with the postwar situation, I want to remind myself that we are still in the midst of a global war — the greatest in our history. While we meet, American boys are engaged in savage fighting against ruthless enemies in every quarter of the globe — on land in Italy and on faraway atolls in the Pacific; in the sky over Europe and Asia; and at sea. Fresh casualty lists are being issued every day, and the heaviest fighting still lies ahead. The most sobering thought of all is that on the last day of the first World War, there were some 26,000 casualties. We have not won this war yet. The first responsibility of every man, woman, and child in America is to see to it that they are making the maximum contribution toward winning the war. That must have a triple A priority.

Nevertheless, while we have not yet won the war, the three international gangsters have lost it. But it is well to remember that only by a hair did they miss recreating a feudal world in which they would have been the masters. Today Mussolini, who said "I spit on democracy," is living in abject terror. Hitler, who is said to have danced for joy when France fell because he thought his dream of world conquest had been realized, is now having nightmares. Tojo, who in July, 1937, predicted victory in six months over the Chinese, is now telling his people that the war may last 100 years. But it will not. Our fighting men may bring us victory in 100 weeks instead of 100 years. For that we owe them an obligation of such magnitude that we can never hope to repay it.

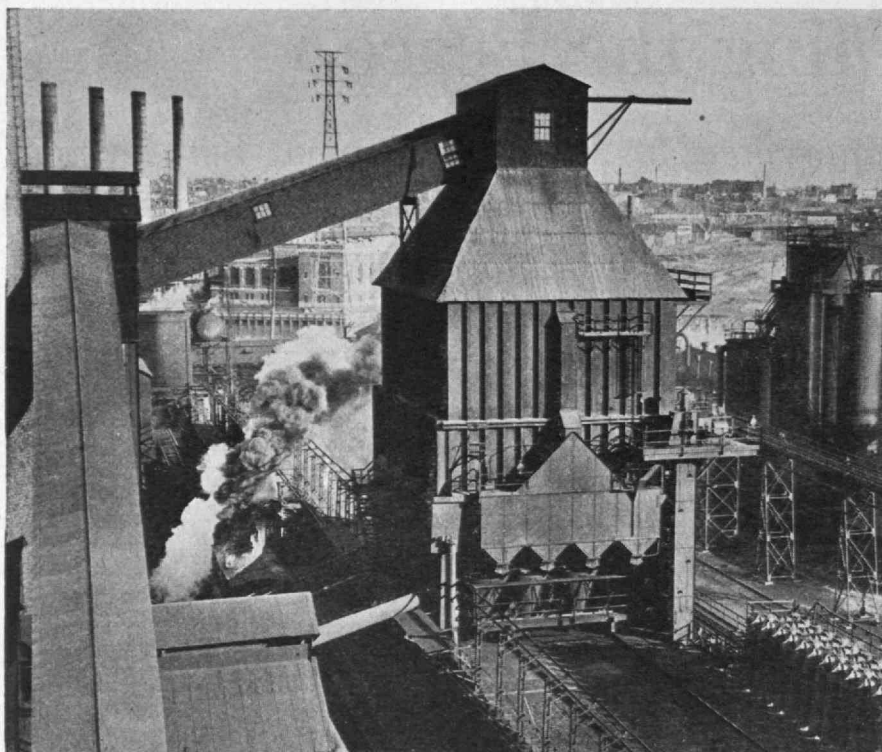
The least we can do is to make certain that we on the home front do not lose the peace for them while they are winning the war for us. The peace will be lost if we fail to take steps now to prevent either mass unemployment or mass government employment in the postwar period. We must avoid those pitfalls.

As the first step in that direction I have suggested to businessmen that it is important for us to try to measure as precisely as possible the task that lies ahead from the



"... All the tangible factors essential to the realization of the objective will be present when peace comes. . . ."

A. J. Baker



Representative of American industry built on research is this New Jersey coke plant of 3,000 tons' daily capacity.

Ewing Galloway

our attention on and take as our first postwar objective the attainment of a record-breaking increase in our gross output of peacetime goods and services over the record-breaking year of 1940, when national gross output was \$97,000,000,000. That has to be stepped up by 30 to 45 per cent.

The hazards of concentrating our whole attention on the number of jobs needed in the postwar period are very real. Already because so much has been said about full employment and so little about full production, fallacies are creeping into our thinking. The spread-the-work idea is being exploited energetically. Representative Arthur G. Klein of New York has introduced in Congress a bill which, to quote its own language, is "to aid in the stabilization of the economic structure of the United States after the present war by amending the Fair Labor Standards Act to provide for the gradual reduction of the work week to thirty hours." From various other persons has come the suggestion of a 30-hour week with 40 hours' pay immediately at the close of the war.

standpoint of the number of jobs needed. The phrase "full employment," which one so frequently hears, is vague and perhaps has implications of overpromise. Fortunately, when the various groups interested in the postwar employment situation cease dealing in phrases and start dealing in figures, they reach about the same conclusions: The Committee for Economic Development, for instance, estimates that we shall have a very satisfactory situation if, after reconversion, we have 53,000,000 to 56,000,000 civilian jobs, as compared with 46,000,000 in 1940, our last full peacetime year. Philip Murray, President of the Congress of Industrial Organizations, has named 55,000,000 civilian jobs, or some 9,000,000 more than in 1940, as a goal that would be satisfactory to labor. The Brookings Institution recently estimated that 8,000,000 more civilian jobs than in 1940, or approximately 54,000,000, will have to be provided after the war. Both the Murray and the Brookings figures fall within the bracket set by the Committee for Economic Development. The important figure on which to concentrate is that of an increase of 7,000,000 to 10,000,000 civilian jobs over 1940. This is the increase needed if we are to meet the minimum requirement of winning the peace—that is, the avoidance of mass unemployment or mass government employment.

In my opinion, however, stating our goal in terms of jobs is not enough. We might have "jobs for all," to make use of a popular phrase, and still be marching straight down the road to disaster. We'll not have the kind of America we want after this war is over if millions of men are employed on some form of W.P.A. or if millions of men have to work at sweatshop wages. Our postwar jobs must be productive and well paid.

Jobs are a by-product of production and distribution. Therefore if we are to achieve a goal not only of jobs enough but also of jobs of the right kind, we must focus

Neither Representative Klein nor other proponents of the 30-hour week contend that 40 hours of work a week are excessive; their aim is to provide more jobs by spreading the work. They forget that only by producing more can we have more to divide. They don't realize that they are preaching a gospel of despair and launching nothing other than an attack on our standard of living. Philip Murray went to the heart of the problem in a recent speech before the Economic Club of New York: "When the war ends," he said, "hours will be reduced by some amount, possibly to a national working average of less than 40 per week. But we must avoid the concealed unemployment that hides behind short hours, and means only a sharing of misery."

The second fallacy, which is a direct result of focusing solely on jobs in terms of numbers, is a reappearance of that old *bête noire*, technological unemployment. Once more we are being told that technological advancements accumulating during this war period should be introduced in our postwar economy with great caution. My one fear is that it will require too long a time to take advantage of the new materials, the new manufacturing processes, and the new inventions which have been spawned by our tremendous war effort. Only by speeding up, not slowing down, the application of these advances can we bring into full play that prime tool for expanding markets—better, fresher merchandise at prices that represent better values.

Not only must we take advantage immediately of all that has been learned in the war but we should also step up commercial research as soon as our technicians are no longer needed for the war effort. Before the flush period of postwar buying has spent itself, we must have further advancements ready in order to give new stimulation to the market. Perhaps these feeble words of mine on behalf of commercial (Continued on page 358)

The Archangels' Gifts

Great Decisions on the Preservation of Peace Must Be Thought Through to the End; Military Solutions Necessarily Depend on Political Commitments

BY SHERMAN MILES
BACCALAUREATE ADDRESS

I KNOW of no greater pleasure for a soldier in this war than to give the baccalaureate address to a graduating class of the Massachusetts Institute of Technology. We of the Army have had little opportunity to acknowledge our debt to the Institute. But we well know that it has been one of the rungs of the ladder by which we have climbed the long way from military impotency to aggressive leadership.

I remember returning in the fall of 1940 from the First Army maneuvers in northern New York. The Axis powers were then at the height of their extraordinary military successes in Europe, Africa, and Asia. Not many months before, I had seen in England and on the Continent the armies and fortifications on which the Allies had counted so confidently and so erroneously to check the German might, and eventually to win the war. In our own Army maneuvers, I had seen troops hopelessly inferior in training and equipment to those which the Germans had easily overrun. Our National Guard regiments had only their confidence and zeal to commend them. Both our Regulars and National Guard were equipped with archaic weapons or with funny little devices of wood made to represent machine guns or tanks. It was about the nadir of military unreadiness and discouragement in this country. But I came back from those maneuvers with two great scientists, one of whom was your President. I remember thinking that if Fortune would only grant us time, the brains of Dr. Compton and men of his standing might help us to avoid the abyss. It was, indeed, a matter of pitting brains and courage against time.

So today I am happy to render, even in small part, the homage which is due the Institute. Its actual contributions cannot now be weighed. Perhaps they never will be. We know only that the M.I.T. came in from the first, with complete disregard of its own interests and with a willingness to assume great financial risks at a time when government appropriations were not stabilized or even assured. We know also that it has steadfastly adhered to its policy of giving no consideration whatever to any interests or activity which would delay or render less effective its own war effort.

Modern war is fought by men, equipment, and brains. The fighting man is the ultimate factor in success. But he cannot be considered apart from the means with which he fights or from the brains which evolve those means. Two types of brains, in fact, definitely enter into the equation which results in victory. I am not so bold as to attempt to evaluate the brains which direct military operations as against those which give us the wherewithal to fight. Such an attempt would lead one far into the imponderables, for modern war employs everything from

a great battleship to a hand grenade, from electronics to the clothes which protect a soldier in the arctic or the tropics and the medical science which keeps him fit to fight.

The impact on war of the brains which equip the fighting man as differentiated from the brains which lead him — the technological versus the military brains — is a relatively new thing. It was almost wholly lacking in the time of Napoleon. For 20 years that great captain fought some of the most brilliant campaigns in military history. He was unquestionably a military intellect of the highest order. But he fought his last battle with much the same weapons and equipment with which he had begun his first campaign. His indifference to technological improvement in any device that would serve his military aims is incomprehensible in the light of what this Institute is doing today.

The brains that equip the modern fighting man, that permit him to see in the dark and to strike his enemy far beyond the range of vision, that enable him to endure almost beyond human endurance — all this varied technology adds up to a direct contribution to the armed forces. It also, curiously enough, indirectly affects those forces by enabling their leaders to integrate them as they have never before been integrated in war. It is indeed a paradox that the enormous complexity and variety of technological development should aid the integration of forces into the single aim of crushing the enemy. And yet it is so.

You who are young do not realize how greatly war has changed in the past half century. Let me make a comparison. Our oldest military organizations of New England date back well over 200 years. I suggest that a soldier of those old days would have been much more at home in our Army in Cuba 45 years ago than would be a New England veteran of the Spanish-American War in our Army in Italy today. In my youth, the Army was a fairly simple thing. We had infantry, cavalry, and artillery, with the engineers standing to one side and slightly aloof. There was also the Navy, a thing apart. We built concrete forts to protect our cities from naval bombardment, but beyond that, and of our own Navy, we thought but little. We were simple forces and quite disintegrated. I need not tell you of our modern complexity; in fact, I am not sure that I know all the various players even by name. But I know they play on the same team. The task force, large or small, that combination of sea, land, and air power, is the true symbol of war today.

To those of us who were privileged to work in past years on joint Army-Navy plans, privileged to cruise on our ships of war and to strive for an intelligent integration of the two great services in action, all that has hap-

pened recently, from the Solomons to Salerno, makes our hearts glow. We are becoming one team, the great team, the all-American team, far beyond the vision of Walter Camp. Perhaps we of the Army and Navy owe this largely to air power, which we both share and without which we are largely impotent, even in our own spheres of action. This integration of the three great powers — air, land, and sea — which is so new a thing, must be carried on and on, ever approaching perfection. The team is so much greater than the sum of the players. In its broadest sense, war is all one, no matter what may be the complexity and variety of its weapons. Victory is the reward of integration.

You young men will soon enter one of the armed services. You will be taught much of war and much of life — much that will be useful to you as long as you live. I leave all that to your officers and noncoms and to your own receptive minds and willing bodies. Today I want to talk to you on broader lines. As sons of M.I.T., you will play your part in the destiny of your country in this war and beyond it. Look squarely into the face of war. Absorb the details you must know, but do not miss the forest for the trees.

Let me tell you a story of the ancient East. The tale relates to the creation of man. The Lord God was pleased with His handiwork, and the angels stood about admiring it. Lucifer, the archangel, not yet fallen from heaven, asked the Lord if he might give man four gifts. The Lord hesitated — Lucifer was even then plotting his great revolt. But Michael, the good archangel, said, "Lord, let me also give man four gifts." And the Lord, thinking that Michael's good gifts would balance Lucifer's evil ones, consented, and so it was done. But the four gifts of the one turned out to be the same as the four gifts of the other — wine, women, work, and war.

You will see, more clearly than others have seen before you, war as Lucifer meant it and as Michael meant it — war waged to enslave, and war waged to free men; war as an abomination, and war as a crusade. Look you well to this. For the four gifts still stand.

Throughout the years of your manhood, this country will face the paramount problem of the prevention of war for the devil's purposes. We suppressed it 25 years ago. We are suppressing it again, through Michael's gift, but at almost ruinous cost. You young men of the next generation must evolve something far better. You must learn to use armed force, the power of war, to prevent war. That is the true cancellation of Lucifer's gift by Michael's. Look you therefore at those armed forces which you will join, not only in their present kinetic role of suppressing great evil but also in their future role of keeping Lucifer in the pit into which he has fallen. Look you to the forest as well as to the trees.

And so, even now, when you are straining at the leash of war, I put to you something of what lies beyond this war. We must win the peace — granted; but we must also maintain that peace. We have had a whale of a lesson, impossible to ignore, difficult to forget. Not a single soul in this hall will outlive the direct effect and burden of the war we wage today. Our victory is now forming in the far reaches of the world. Yet even if it be absolute, as it will be; even if it be soon achieved, as it will not be, it will be a Pyrrhic victory. One more such, and we are undone. Civilization as we know it, any way of life we consider tolerable today, simply could not

withstand the disintegration of another such world war. Militarism has become progressively shattering as the industrial revolution has poured tool after tool and weapon after weapon into the caldron of war, raising the cost in human energy, wealth, and lives in geometric progression. This fact we soldiers and sailors know, since in the final analysis it is to us that these things pass.

Let's go back a bit and look at the role of armed forces in American history. Washington's farewell admonition was "always to keep ourselves, by suitable establishments, in a respectable defensive posture." The first President also said that we should be "respectable in the eyes of our friends and formidable to those who would otherwise become our enemies." Hence our armed forces have really been maintained for two primary purposes: first, to deter by their potential power any nation that might otherwise attack us, and, second, by their kinetic strength to restore peace expeditiously if war came.

In the century and a half of our history, our armed forces have been successful as agencies in the restoration of peace. In each of our various wars they have brought us an acceptable peace otherwise unobtainable. But as deterrents to potential enemies, as agencies in the maintenance of peace, they have not been wholly successful. Leaving aside our two minor wars with Mexico and Spain in which we engaged of our own volition, and the Civil War which was inherently inevitable, the outstanding fact is that we have, against our will, been drawn into each of the three great wars of conquest which have rocked the world since we achieved our independence. Washington's idea that we should be "formidable to those who would otherwise become our enemies" has not always worked.

The conclusion, I take it, is that our armed forces, at least on any scale comparable to that which we have so far maintained, do not enable us to stand aside from the world at war. They are by no means a sure shield when the great conquerors march, even though the immediate aim of the conquerors be far distant from our shores. It is perhaps even more significant of the impotency of our armed forces as pacific agencies that we were drawn into the Napoleonic struggle than that we should have been involved in the later ones. For in 1800 and in 1812 we were a minor nation, far removed from great world affairs. In the next hundred years we grew and the world shrank.

It should also be noted that our armed forces have proved inadequate whenever we have been drawn into a great war. Fortunately, through circumstances not of our making, we have always been granted time feverishly to correct their inadequacies. And that, it would seem, is about as long a run of luck as we are entitled to expect.

Yes, I know the isolationist will tell you that we need not become involved in foreign wars. The pacifist will tell you that after this conflict, there will be no more wars for world conquest. Perhaps. But the burden of proof lies heavily against them. The facts are plain: Three such wars in our short national life — two in a single generation — and we have not once found it possible to stand aside or to exert our strength with any celerity when we came in. And yet these great wars are ruinous, win or lose. There must be some alternative.

It would seem that we must come to collective security, the preservation of peace by international co-operation. The decision, in embryo at least, is (*Continued on page 374*)



The Force of Ideals

*Trained Intelligence, Powerful As It Is, by Itself Is Not Enough;
Altruism, Integrity, Dependability Must Guide It
If the World's Work Is to Be Well Done*

BY KARL T. COMPTON
VALEDICTORY ADDRESS

EVERY college President, I suspect, feels an overpowering sense of humility and inadequacy when he delivers his "farewell and Godspeed" address to any graduating class. There is so much he would like to be able to say of help and encouragement and he knows that his best efforts fall far short of his ideals. I feel thus more than usual today because I have been unable, during the period of your course here, to maintain the normal degree of personal acquaintance with you and contact with your affairs and your problems. This I very much regret.

Anthropologists tell us that the most progressive peoples have been those who inhabit the temperate zones. The reason is supposed to be that here the contrasts and variety of the seasons are more stimulating than the lazy comfort of the tropics or the harsh severity of the arctic. If contrast and variety are good for the human race, you have this benefit to an unusual degree. You were born at

about the time of the mild economic depression which followed the last War, when the world was believed to be "safe for democracy" and the "war to end all wars" had been fought. About the time you entered elementary school, the world looked very rosy: Fortunes were made on paper and in real cash with the greatest of ease; the national debt was being reduced; political parties could boast or promise a high standard of living for all. Then came the plunge into the worst depression in the nation's history. We discovered that the foundations of our prosperity were not adequate; we tried frantic remedies, some sound and some silly. By the time you got to secondary school, we were climbing back up the hill again, sadder and I hope wiser.

During this time, while we were worrying with our own affairs, forces of ambition and aggression abroad were again mobilizing their powers of threat and destruction. By the time you entered the Institute, war had broken



out more dangerously than ever before. The future of democracy and freedom looked indeed dark, and we in America began belatedly to face this issue. Then came Pearl Harbor, and we were in it to the finish.

Now, as you are graduated, the outlook is much more hopeful. The enemy is being thrown back on every front. But don't let anyone feel that the job is nearly done. Though we have had our first successes on frontiers, though we have done some internal damage to one of our foes, we have not yet proved that we can defeat him as he goes on the defensive — and we know that he still has up his sleeve some offensive tricks which may be very powerful indeed.

But to come back to you: I doubt whether ever before in history 20-year-old youths have grown up in such a variety of economic, political, and emotional environments. I hope that the anthropologists are right and that this variety of experience may, like changing weather, stimulate you to face the problems of life with more realism, with more vigor, and with high ideals which have been sharpened and not dulled by the facts of life.

Now let me preach a brief sermon. Were I a minister of the gospel, I should probably build my thoughts around a text from the Holy Writ. As a scientist, I choose some scientific law around which, by analogy or illustration, these thoughts can be arranged. I do so with misgiving lest you feel that you are being put back in the classroom.

But I am encouraged by a little paragraph from the *New Yorker* which the Head of our Mathematics Department, Professor Phillips, is carrying around for the amusement of his colleagues. Professor Phillips recently wrote a book in which he had occasion to define elementary mathematical functions. He made a simple statement to the general effect that algebraic, trigonometric, inverse trigonometric, exponential, and logarithmic functions are elementary functions. Apparently the *New Yorker* thought this was funny. Professor Phillips thinks that it is funny that the *New Yorker* thinks it is funny. Question: Who thinks it is funny that Professor Phillips thinks it is funny that the *New Yorker* thinks it is funny? Answer: the students.

Well, the point is that I hope you will not think it funny if I digress a moment on the subject of the second law of thermodynamics. I hope that Professor Wiener will not be too critical of the philosophic soundness of my argument and that Professor Millard will not feel hurt because I neglect the third law of thermodynamics.

According to the second law of thermodynamics, power cannot be secured from the heat content of a system if all its parts are at the same temperature. Furthermore, all interactions in the material universe are to a greater or lesser extent irreversible, which means that all energy is gradually becoming transformed into heat. This heat, by

conduction, convection, and radiation, gradually spreads through the universe to bring all parts to the same temperature. Thus, by the second law of thermodynamics, the universe is tending to run down. Its specialized assemblages of potential energy — the chemical energy of coal, the gravitational energy of the mountains, the kinetic energy of the planets — are all gradually being transformed into heat — the lowest form of energy because, when it is all evenly spread around, none of it can be used to do work. This dismal fate, sometimes called the "heat death" of the universe, is too many billions of years away to worry us much.

Let me go back: According to the second law of thermodynamics, power cannot be secured from the heat content of a system if all its parts are at the same temperature. Clerk Maxwell suggested a hypothetical manner by which power could be secured from such a system: Suppose that the air in a room is all at the same temperature and that the walls are perfect heat insulators. Divide the room into two parts by a partition with only a very tiny hole in it just large enough to let a molecule of air pass through. Then imagine a little fellow, like a gremlin, perched beside this hole with a trap door of infinitesimal mass with which he can close or open the hole at will. Whenever the gremlin sees a particularly speedy molecule approaching the hole from east to west, he lets it pass through. Similarly he could let slow molecules (*Continued on page 368*)

The Laboratory of War

From the Rapid Development of Implements and Techniques Imposed by Warfare, Lasting Contributions to Civilization Are to Be Foreseen; Here Is Encouragement for Scientist and Engineer

BY EDWARD L. COCHRANE

MILITARY ADDRESS

THE circumstances of this commencement, taking place as it does in the very midst of World War II, have an especial significance for me personally. For, at the outbreak of the last World War, as a young ensign just three years out of Annapolis, I was here at the Institute, studying in the Course in Naval Architecture. Within a week of that fateful Good Friday of April 6, 1917, mobilization orders came, and we left our books to go to active service in East Coast shipyards. Two and one-half years later, with the nation once more at peace, we resumed our studies, and finally, in June of 1920, I was privileged to sit among the graduating class in just such ceremonies as these.

This personal experience gives me, I believe, an insight into the thoughts and problems which you have had during the two long years since December 7, 1941, and which confront you now, as you leave your work at M.I.T. — many of you to enter into the service of your nation at war. No doubt some of you feel that you have been overlooked — neglected — in not having been permitted to join active units earlier. I, too, suffered from that feeling during the few days we waited for our orders in 1917.

You, however, are more fortunate than I in that you have been held on to complete your studies — a luxury in which the nation could indulge itself this time and from which it will get the better return from you as trained men during the war and in the future. In this respect yours is the good luck to have been born at just the right moment, for you are going out at a time when you can still get a fair share of the accelerated experience that goes with active service in the war and, what is more important, can look forward to years of participation in what will surely be a remarkable era of scientific and engineering development in the postwar period. While I would not venture to predict the war's ending, none will challenge the statement that the day of demobilization is still far beyond the horizon. Certainly enough months of the war lie ahead to give every man among you an ample opportunity to win his spurs.

Following World War I, as you will recall, the world was swept with a tide of optimism about the future of international relations. Out of this tide developed a series of treaty limitations on naval armaments. As an additional restriction, national policy at that time frequently set ceilings on the cost of ship construction, which definitely limited the extent to which any experimentation could be undertaken.

Beginning in 1933, these restrictions have gradually been lightened, and since the authorization of the two-ocean Navy in July, 1940, following the fall of France, one expansion has followed on the heels of another until today

we are speaking of the Navy's many fleets which, when completed, will be strong enough to cover the five oceans and the seven seas. For years Congress has granted every request for additional authorizations and funds to meet the needs of the emergency naval shipbuilding program. This co-operation, which made possible in 1943 alone the delivery to the fleet of one and one-half million tons of fighting ships and two million tons of naval auxiliary vessels and other supporting craft, is the answer to those who comforted themselves with the conviction that a democracy could not function effectively in time of war.

War periods are always periods of rapid development of military and naval equipment. As far as naval architecture and marine engineering are concerned, the war has done more than merely lift treaty and cost limitations so as to permit us to build more ships. It has furnished us with that which no amount of money can buy — the tough but invaluable experience of operating under actual combat conditions. Study of the damage from projectile, torpedo, and bomb attacks which not a few of our ships have absorbed and survived has clarified for us many points over which we have been pondering. In peacetime the design of men-of-war must in the main be guided by imagination supported only by limited experimentation. The lessons learned from the burning and sinking of the U.S.S. *Lexington*, *Hornet*, *Quincy*, and *Vincennes* have led to important improvements in fire protection and control. The salvage of the *Normandie* and of the ships which were sunk at Pearl Harbor has made possible the development of skills and techniques in a field with which the Navy had previously had only a limited acquaintance. Other examples could be listed almost without end, but the point is clear.

Active warfare is a battle of skill and ingenuity between opposing forces, not only in operations on the field but in the development of all the munitions of war. In peacetime we try to outguess ourselves on the blueprint and on the blackboard, but it is a fundamental, well established by experience, that you can expect the enemy to turn up with weapons at least as good as your own. We must be prepared to meet an attack equal to our best and to counter any developments which the enemy may have achieved beyond our own. Widespread employment by the enemy of influence mines put the Allied forces on their mettle in the early days of the war to develop effective mine-sweeping measures. Success of the Nazi submarine warfare in the Atlantic was matched by the development of the even more successful counterweapons of the patrol craft, the destroyer escort, and the baby flattop.

The demands of our fighting forces for new instruments of warfare, specially designed for particular conditions of operation, have forced us to depart from conventional lines of approach and have opened up whole new avenues

of development. Perhaps the outstanding example has been the design and development of not one but a dozen distinct types of landing craft. Some are adapted to navigate heavy seas, while at the same time being capable of landing troops and tanks on enemy beaches like those at Sicily and Salerno; others are designed to travel on both sea and land and to negotiate coral reefs like those at Tarawa in making the passage from the one medium to the other.

Finally, the scarcity of critical materials, which developed as the inevitable consequence of the magnitude of our war production program and the loss of foreign sources of supply, has posed new problems. Under national mobilization, scientists and engineers have been called in from every branch of civilian endeavor to work on these problems as well as the myriad other problems which have confronted us in our war production effort. Truly great progress has been made in finding the best solutions, as is evidenced, for example, by the work which has been done in the development of plastics and synthetics, many of which are proving to be more effective and economical than the materials for which they have been substituted.

In a very real sense, therefore, war is a period in which the young engineer and scientist can in a few months take strides which in peacetime he would struggle for years to achieve. I am convinced that all branches of science will emerge from the laboratory of this war with advances of far greater import than the mere development of highly perfected instruments of destruction. Who, for example, can foresee the lasting contributions to civilization which may grow out of peacetime applications of the work which has been accomplished in electronics?

That is why I believe that this graduating class is in a position of unique good fortune in having been able to complete the sound basic training given by M.I.T., and to finish it in time to test and apply its principles in the experiences of the war which still lie ahead. With the back-

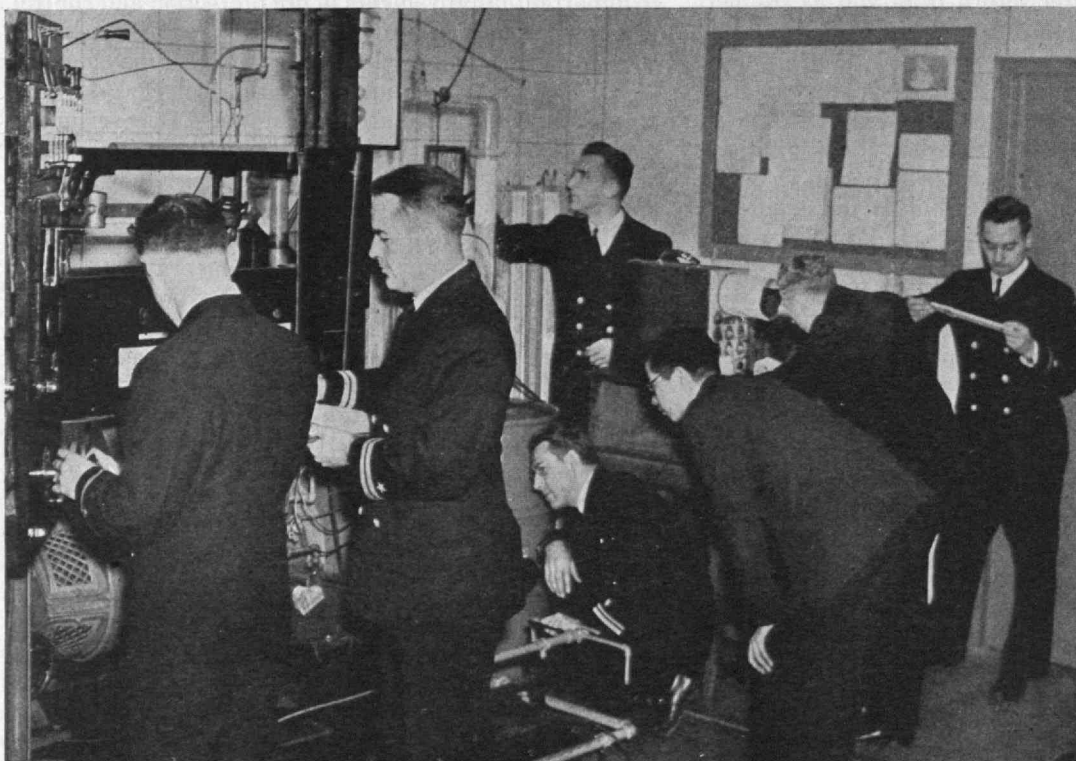
ground of this training and the practical lessons which you will learn in the course of your war service, you will be perfectly equipped to tackle what Bernard Baruch prophesies may be our "adventure in prosperity" after the war.

With regard to the position which our Navy may occupy in that postwar period, it is my earnest hope that the progress which has been made in the last two or three years, and which seems certain to continue at least to the end of the war, will not stop with the declaration of the armistice. It is now a foregone conclusion that we shall emerge from the war as the greatest naval power the world has ever seen. By the end of this year the strength of our fighting fleets will be equal to that of all other nations combined. The maintenance of that relative strength in the postwar period is our surest guaranty of something approaching world peace.

The preservation of our naval supremacy is the responsibility of the nation at large. It will be the responsibility of those of you who stay in the Navy to see that that organization continues to justify the confidence which the nation reposes in it. Yours will be the task of keeping the progress of naval thinking and action in the forefront of the general advances which are looked for in the days to come.

Many of you will return to civilian activities when the war is over. We hope that you will carry with you an affection for the service. We know that you will leave behind you the respect and high regard of others for your accomplishments which, with your own satisfaction over a job well done, are the chief rewards for active duty.

It is a wonderful thing to have the opportunity to be of service to one's country in times like these. Yours is the greater opportunity, for you will be allowed to continue your service into the postwar period, when so much will have to be done to keep this war also from having been fought in vain. I envy you these greater opportunities. I know that you will make the *(Concluded on page 368)*



As in years past, naval officers are at work in the laboratories of the Institute.

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

Of Times and War

Alumni Day 1944 Marked by Concern with Technology's Past, Present, and Future As War Bears upon Them

TECHNOLOGY'S past, present, and future — in terms of the development of scientific and technological education, the contributions of manhood and research to the war, and the great part which industry based on science and technology must play in the ultimate transition to peace — bulked large in the minds of all who shared in Alumni Day 1944 and its attendant festivities. It was appropriate therefore that these notes should be struck many times in the various programs, that speakers should discuss them from varied points of view, and that particular events should signalize them.

Beginning with the events of Class Day on February 26, and extending through baccalaureate Sunday and commencement day, February 27 and 28, thoughtful and stimulating consideration of the demands of war and the problems of peace marked the addresses about which ceremonies centered. As Alumni Banquet speaker, Paul G. Hoffman, chairman of the Committee for Economic Development, cogently stated the case for planning and reconstruction. Major General Sherman Miles, commanding general of the First Service Command, in his baccalaureate address emphasized the share of science in modern warfare and the inadequacy of warfare by itself as a means of security. Claude M. Fuess, headmaster of Phillips Academy, commencement speaker, in discussing the relationship between man and the machine, argued for emphases closely analogous to those sought by General Miles. President Compton in his valedictory to the Class of 1944 and Rear Admiral Edward L. Cochrane,

'20, chief of the Bureau of Ships, in the military address to the graduating class, foresaw reason for hope and confidence in the strength bred of present troubles. It is The Review's pleasure to present these addresses elsewhere in this issue, and later in this section to publish Dr. Compton's annual survey of the state of affairs at the Institute, which this year as in years past was a feature of the Alumni Day Banquet on the evening of February 26.

More than 1,100 attended the yearly stein-on-the-table function that evening, those present including Alumni, Alumnae, a number of guests, and the members of the Class of 1944 who, as newly inducted members of the Alumni Association, were guests that evening of the Committee of Alumni Hosts. Herbert R. Stewart, '24, general chairman of Alumni Day 1944, and Josiah D. Crosby, '21, chairman of the dinner committee, sighed the sigh of work well done as the program went smoothly forward, again evidencing effective work on the part of the various committees responsible.

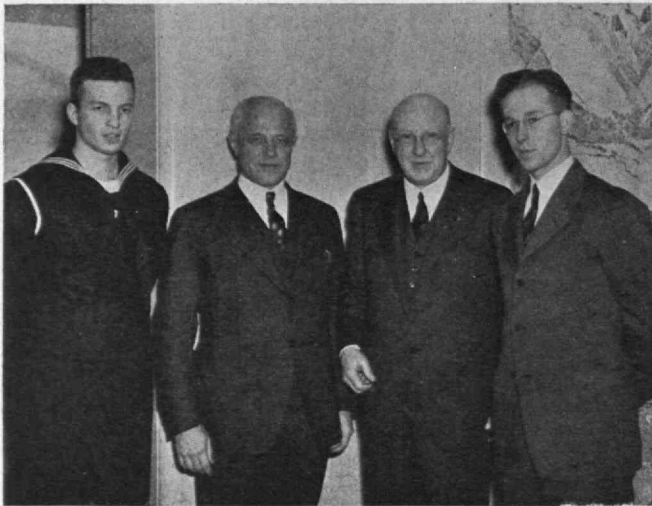
. . . Class Day . . .

For Class Day exercises on the afternoon of February 26, return was again made to the historic site on Boylston Street, the exercises being held in New England Mutual Hall. Welcomed by Lamar Field, '44, chairman of Senior Week, parents and friends of the Class as well as numerous Alumni heard addresses by speakers for the 50-year and 25-year classes; transfer of the class ring to John L. Hull, President of the Class of 10-44, by Langdon S. Flowers, Vice-president of the Class of 2-44, who acted for George A. Schutte, Class President now in service; presentation of the class gift — a contribution of \$1,500 to the Alumni Fund — by Mr. Flowers and acceptance of it by Presi-



M.I.T. Photo

As the banquet of Alumni Day 1944 convened, at the head table were, from left to right: Herbert R. Stewart, '24, chairman of Alumni Day 1944; Charles E. Locke, '96, Secretary of the Alumni Association; Frank D. Gage, '22, arranger, and John B. Wilbur, '26, author, of *Sons of M.I.T.*; Lieutenant Colonel Joseph F. Cook, Jr., '22, commanding officer, Army training schools, M.I.T.; Major General Sherman Miles, commanding general, First Service Command, baccalaureate speaker; Paul G. Hoffman, chairman of the Committee for Economic Development, banquet speaker; Francis J. Chesterman, '05, President of the Alumni Association; President Compton; Rudolf F. Haffenreffer, '95, President of the Technology Club of Fall River; Captain Charles S. Joyce, commanding officer, naval training schools, M.I.T.; Donald D. Way, President of the Class of 1919; Langdon S. Flowers, Vice-president of the Class of 2-44; John L. Hull, President of the Class of 10-44; and Josiah D. Crosby, '21, chairman of the dinner committee.



M.I.T. Photo

At New England Mutual Hall before Class Day: President Compton and President Chesterman flanked by Langdon S. Flowers, Vice-president of the Class of 2-44 (left), and Lamar Field, '44, chairman of Senior Week.

dent Compton; the Beaver oration by Garry C. Myers, Jr., '44; presentation of the class banner of the Class of 1944 by Francis J. Chesterman, '05, President of the Alumni Association, and acceptance of the banner by Mr. Flowers.

As representative of the Class of 1894, celebrating its 50th anniversary this year, Alan A. Clafin, consulting chemist, called the roll of distinguished members of his Class in the course of a witty address. Mr. Clafin spoke in part as follows:

It is a kindly custom this, of remembering classes of an earlier period. Whether their representatives appear as inspirations or horrible examples, the classes, I am sure, are grateful for being remembered.

Many years ago with characteristic both youthful and Yankee ill-mannered curiosity, I asked a British officer about his decorations, and he admitted he was proudest of his Balaklava ribbon. As a Yankee not appreciating the synonymity to the British mind of Balaklava and the charge of the light brigade, I asked, "And what did you do at Balaklava?" He replied, "I survived." Thus you may know we really appreciate why we are here today. We are the survivors, of an era forgotten, but to the literate the jubilee period of the Victorian age and to the radio fan the Gay Nineties.

This period surges back to us with nostalgic memory since we are met by wartime exigency in this building erected on the site of the original Technology buildings, buildings honored by the names of Rogers and Walker. These surroundings, unfamiliar to you, are hallowed by fond recollections to us. Were there time, I should like to conduct archaeological exploration in this area, and see what evidences of an earlier civilization might be uncovered. Certain landmarks still remain, as the church tower whose gilded celestial heralds shared with the Gothic entrance to the Hotel Brunswick barroom irreverent designation by the student body. In fact, this neighborhood tends to lead more to reminiscence of student days of long ago than to thoughts of 50 years of professional life which might prove helpful to those about to enter it.

If, however, I were to talk on your professional future, I should ask to speak to you as freshmen rather than as graduates. For our Class, one of the earlier fairly large classes at the Institute, certainly did its bit to the refutation of the theory then largely prevalent that aptitude as a student was not indicative of future success. I have to record the rather melancholy fact that charts of our relative abilities as students and of our future eminence would closely coincide. Possibly some of this is due to the rather paradoxical theory of instruction that then prevailed at Technology; I do not know whether it still persists.

The professor or instructor spends four months of intensive effort in endeavoring to impart some rudimentary knowledge of a subject or branch of science to a group of students, and then by rigorous examination to prove they have been resistant, if not entirely immune, to his instruction. The greater the number of failures he can induce, the greater his reputation on the faculty. This may not be sound pedagogy, but it may have some fundamental psychology. It develops the competitive spirit. The more our professors tried to throw us out, the more the fightingest of us endeavored to stay in. Possibly this is why Technology has perhaps developed more captains of industry than great scientists. Our Class has several who can be placed in the industrial leadership class, one scientist, and a number of high professional attainment. . . .

Again thanking you for the honor of being here, I wish you Godspeed and good luck. You are going forth into a troubled world, but a troubled world is a world of opportunities. I am sure that when it is your time to be the survivors, you will face a fairer world, and your efforts will contribute to make it so. From my own experience may I give you this apothegm:

Concentrate to succeed,
Diversify to be happy.

Eugene R. Smoley, '19, of the Lummus Company spoke as representative of his Class, which this year celebrates its 25th anniversary. Commenting humorously on analo-



M.I.T. Photo

John D. Mitsch, '20, chairman of the Alumni Association's Class Day committee, and Herbert R. Stewart, '24, general chairman of Alumni Day 1944, were photographed awaiting the Class Day exercises (left), as were Eugene R. Smoley, '19, speaker for the 25-year Class, and Alan A. Clafin, '94, speaker for the 50-year Class, with whom President Chesterman was pictured.

From left to right, Rear Admiral Edward L. Cochrane, '20, who delivered the military address at commencement exercises for the Class of 1944; President Compton; Claude M. Fuess, headmaster of Phillips Academy, who delivered the commencement address; and Major General Sherman Miles, baccalaureate speaker.



M.I.T. Photo

gies between present undergraduate days and those of his own Class in the Institute, he went on to discuss what engineers and engineering have done to better conditions of living in the quarter century intervening. "Present-day philosophers sometimes take a gloomy tone," he said, "and have us believe the world is going to the dogs. But every engineer knows it isn't so. We can agree with them that technological progress isn't all there is to marching forward, but it is a big part of it. They can't discount entirely the things which have come about since 1919." Citing a number of specific achievements, such as improvements in the automobile, the development of radio, the production of nylon and rayon fabrics, the contributions of research to medicine in the sulpha drugs, blood plasma, and penicillin, Dr. Smoley continued:

Yet, experienced engineers are very humble in their estimate of what has been done these last 25 years. They believe we are just beginning to realize how much there is to learn and to do. No longer do men believe, as did Montaigne 400 years ago, that the world's work is practically finished. We figure it hardly has begun. Looking backward, the progress has been wonderful. But it's not to be compared with what you will see and participate in during these coming 25 years.

The petroleum-refining industry, Dr. Smoley declared, is a good case history to illustrate the progress that has been made and the greater attainment which lies ahead. Describing it, he said:

When we left Technology in 1919, the refining of crude petroleum to gasoline and lubricants was done by pot-still distillation. The standard of efficiency was no greater than that achieved by the maker of moonshine in the Kentucky hills, maybe not so good. A million barrels of crude each day then yielded about 200,000 barrels of gas. Today the yield is about 500,000, and crude production is up about four and a half times. But such figures tell an incomplete story because the power value also has gone way up. A petroleum engineer is a sort of fuel bartender. He mixes a power cocktail and measures its potency in terms of octanes.

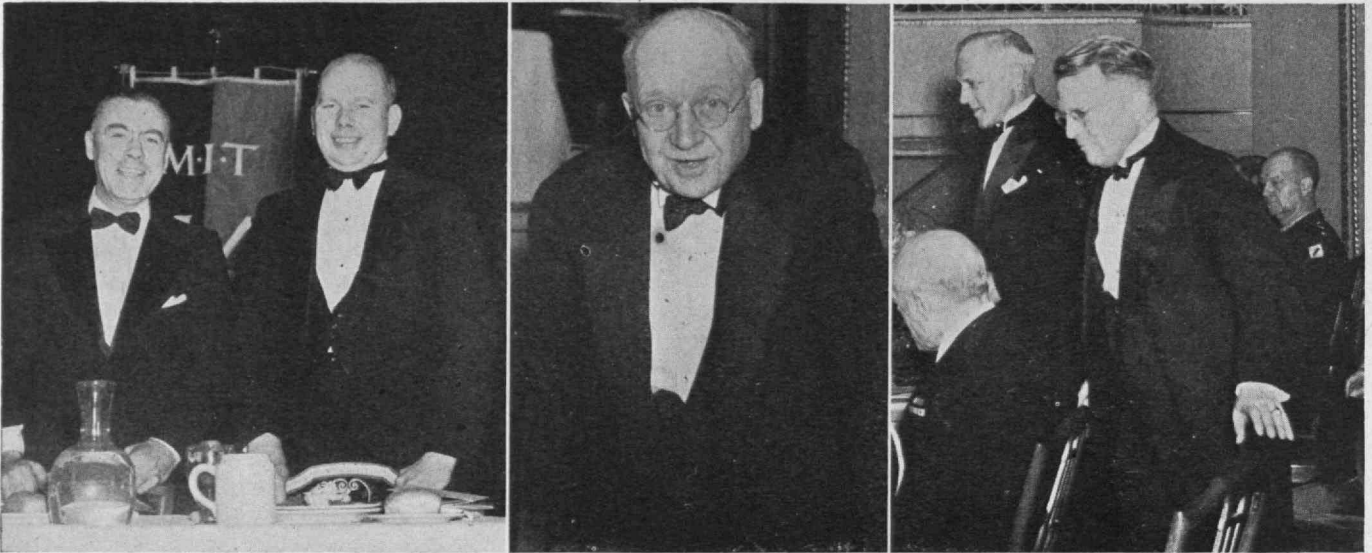
The old Model T Ford, the early single-engine flying crate — they knocked along on a 50-octane gasoline. Improved methods brought the rating up to 70. Then in 1927, discovery of the efficiency addition of tetraethyl added another 15 points. In the 1930's, the process of catalytic cracking served to open a way to make high-octane gas in large volume.

The engines were greedy for it, and like any greedy thing, be it animal or machine, they responded gratefully to those who provided what was wanted. In the Battle of Britain in 1940, the period referred to by Winston Churchill when he said that never in the field of human conflict was so much owed by so many to so few, the British airplanes were powered with 100-octane gasoline supplied by the United States. The Germans used an 87-octane gas. The resultant advantage in British maneuverability, rate of climb, and altitude possibility had much to do with the result.

Gasoline supplies were and still are a war factor of major importance. We took it on the chin plenty at the start of our own war participation. In my mind's eye I can see now a refinery in Sumatra, for I lived three years in that Netherlands East Indies locality. It was a splendid plant, producing 100-octane aviation gasoline and other war products. When the Japs attacked, they sent paratroopers there as a first order of business. On that particular job, they failed. The refinery, which produced 50,000 barrels a day, was destroyed *in toto* before it could be captured. An entire 125-mile pipe-line system to the wells, the entire drilling and production equipment, every tool, motor, and instrument — all were sledged or torched. Furnaces and boilers were melted to slag. Lines were dynamited, wells cemented, fireproofing was removed from supports, pits were flooded with oil and then fired. This destruction was supervised by Americans, who then made their getaway with only a few hours' leeway. But remember, the oil production was lost to us as well as to the Japs. Other attempts at destruction were not so successful. The Japs did capture other refining sources and have been using them.

From the war's beginning, our war leaders knew that however much everything else would be needed, aviation gasoline would be required in hitherto undreamed of quantities. Today it is easy to form a mental picture of such requirements. Two thousand bombers raiding Berlin from bases in England use 100,000 barrels of 100-octane fuel. This amount is equivalent to six months' production in 1937. It isn't only in gasoline requirements that petroleum engineers have been called on to meet war's need. They found a way to make toluol for TNT. No longer is there a threat of a shortage so far as this war is concerned.

And rubber? That might well have been an Achilles' heel for the United Nations except for such men as the M.I.T. has been furnishing to industry through the years. The chemical and oil technologists met this gravest of challenges. When some future word wizard tells the story of industry in this war, the recital of synthetic rubber manufacture will be among his most fascinating tales.



M.I.T. Photo

Frank D. Gage, '22, arranger, and John B. Wilbur, '26, composer, of Technology's new song, Sons of M.I.T., beam for a moment at the left before the Alumni Day Banquet. Charles E. Locke, '96, Secretary of the Alumni Association, is shown in the center in characteristic working pose. At the right, Donald D. Way, President of the Class of 1919, resumes his seat as Dr. Compton accepts the gift to the Institute which 1919's President has just announced.

What the oil industry has been doing in this war, every other industry has done in its own field. The accomplishment of American producers is so great that it will take years for us to realize its full import. We need perspective really to grasp what has been done. But we require no lapse of time to know that this wonderful achievement came not only from nature's bounty in material wealth. Rather, it came from the minds of men, of men trained in the way the members of your Class have been trained.

When engineers get off by themselves and try to look objectively at the world in the manner in which they're accustomed to viewing their task, they sometimes wonder why so much of their work is put to destructive use. They don't know how to explain it. Neither does anybody else. We engineers must remember that our vocation started in war. There were military engineers before there were civil engineers or any other sort of engineer. In a literal sense, we came out of war. Yet it is a confession of human failure when we have to return to it. Not engineering, but generally human failure! The depression of the Thirties, like today's war, is a symptom of illness in human relations. Perhaps it points a duty to engineers, a duty to take part in the world of deliberative councils as well as practical problems. Particularly

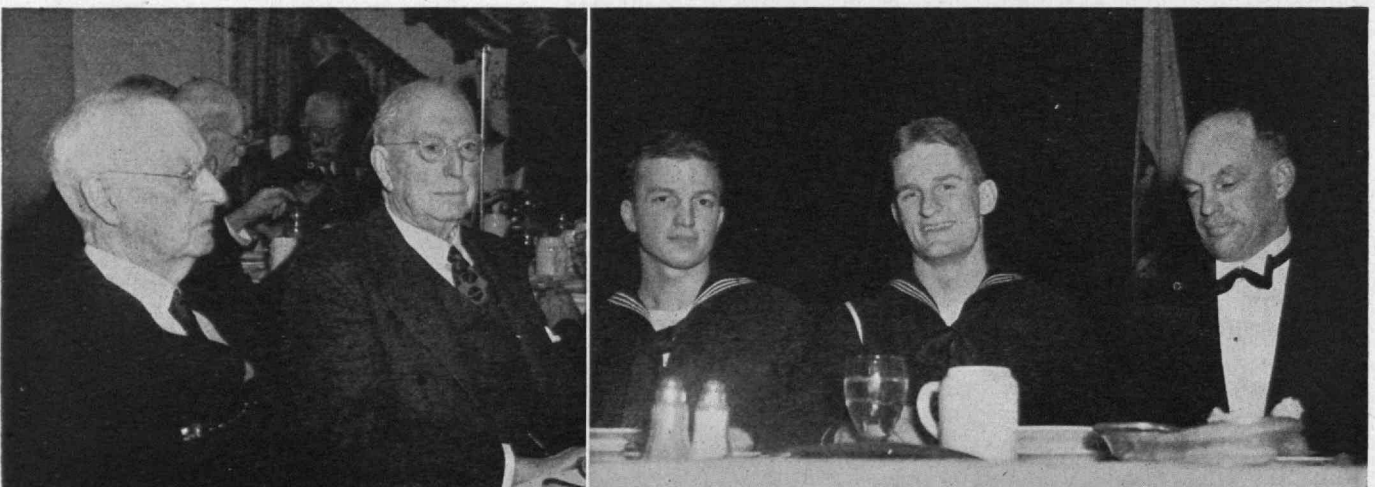
America's engineers! Our country will emerge from this war as the strongest national entity that ever has existed. With such power goes great responsibility. If our engineers help to exercise that responsibility in matters of international decision, perhaps they can determine that the work of their minds and hands will be peacefully directed to the good of mankind.

Concluding by appraising the engineer's place among the classes of men in terms of the importance of the work they do, Dr. Smoley held that the engineer "has a grand chance to lead a life equal in its opportunity for happiness to that of the most fortunate." As definition of what makes a happy life, he cited Albert Einstein's assertion:

A man, more than anything else, wants the good regard and approval of the men in the field in which he works.

. . . In Praise of M.I.T. . . .

When well over a thousand Technology people gathered at the Statler on the evening of February 26 for 1944's variation of the continuing theme of the Alumni Day



M.I.T. Photo

C. Frank Allen, '72, and George W. Kittredge, '77, may have looked dignifiedly solemn for the photographer, but weren't so as they went over Course I gossip of the Seventies during the Alumni Banquet. Langdon S. Flowers, Vice-president of the Class of 2-44, and John L. Hull, President of the Class of 10-44, with Josiah D. Crosby, '21, chairman of the dinner committee, at a pause in the evening's occupation.

Banquet, both familiar and unexpected events were in store. Called to order on schedule (subject, of course, to accustomed latitude of definition) by Francis J. Chesterman, '05, President of the Alumni Association, the program moved smoothly forward through traditional stages and serenely accommodated innovations as well. Prominent among these was the introduction of *Sons of M.I.T.*, a song aptly expressing in both words and air the loyalty of M.I.T. men and women to the institution. The composer, John B. Wilbur, '26, and the arranger, Frank D. Gage, '22, were with the head table guests, to receive well-merited plaudits as the song, rendered first as a solo by George Wheeler, subsequently was used by the whole assemblage to strain the roof beams of the hotel. Frank Gage during the evening was heard in specialties at the piano, some recalling quondam Tech Shows, another — Mr. Gage's own composition — powerfully pleading in musical fashion for all-out effort in support of America's armed forces.

. . . Remembered . . .

The constant thought of war and its demands which marked not only Alumni Day but all the ceremonies of commencement and baccalaureate Sunday found tangible representation during the evening of Alumni Day when President Chesterman called the gathering to stand as a service flag was unveiled, recording symbolically the 49 M.I.T. men who lost their lives while in their country's service and the 5,501 now in service. President Chesterman presented the flag as gift of the Alumni Association to the Institute, in whose behalf it was accepted by President Compton. Attended by no fanfare, but simple and direct, the ceremony was an impressive reminder of the Institute's close relationship to the war and a

sincere remembrance of the thousands of M.I.T. men who could be present that evening in thought only.

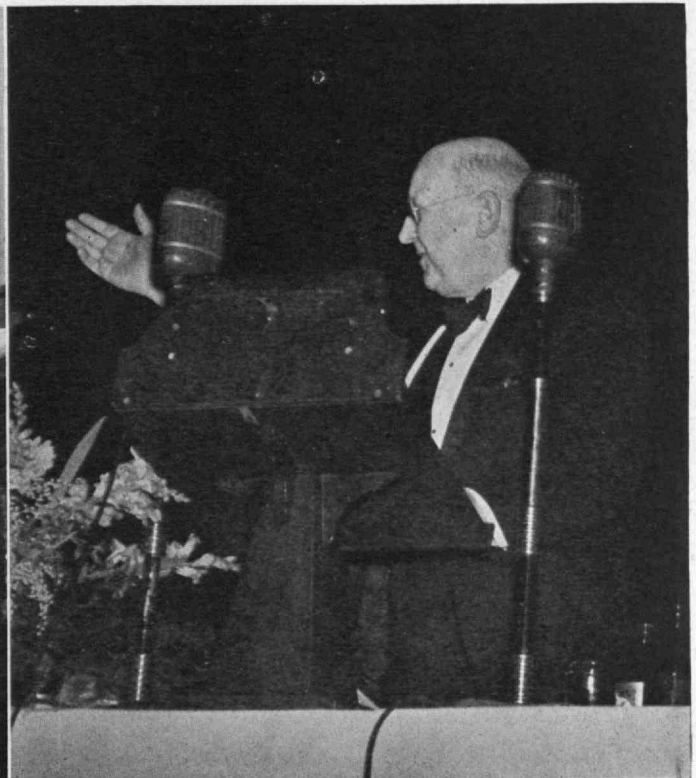
. . . Classes Heard from . . .

It has become custom for the President of the senior class each year to speak for his group as newly inducted members of the Alumni Association and as guests for the evening of the Committee of Alumni Hosts. This year the banqueters had the pleasure of hearing not one but two such officers. Langdon Flowers, Vice-president of the Class which was graduated on February 28, spoke for the February group in the absence of George Schutte, Class President, already in military service. For the Class of 10-44, who will receive their degrees in October, the speaker was John Hull, Class President, in naval uniform as was Mr. Flowers.

But the classes of the present did not by any means have a monopoly. Donald D. Way, President of the Class of 1919, which is observing its 25th anniversary, came to the rostrum during the evening to announce the planned presentation to the Institute of a Class of 1919 Fund, scheduled by the Class as a remembrance on its 25th milestone and to be formally given in July. Dr. Compton received the announcement in the name of the Institute.

. . . Honoris Causa . . .

Two men whose effort and interest — far separated in the means of their expression but intrinsically one and the same in their unselfishness and service — contributed in untold ways to the undergraduate years of hundreds of Technology men were inducted into honorary membership in the Alumni Association at the banquet. Brought forward by Charles E. Locke, '96, Secretary of the Alumni



M.I.T. Photo

Frank D. Gage, '22, was called to the piano for a specialty at a stage in the evening somewhat later than that at which President Chesterman thus gestured, but the two pictures belong in this relationship nevertheless.

Association, they heard President Chesterman in brief but heartfelt remarks summarize the feeling which Alumni have for them and to which the Alumni present testified with hearty applause.

First to be inducted was James L. Tryon, Professor Emeritus, for 16 years a member of the Institute's academic administration. Coming to Technology in 1920, Dr. Tryon first served as assistant registrar, with the rank of assistant professor. He became director of admissions in 1930, with the rank of professor and lecturer in vocational education. His wide study of vocational education was a boon to many among the incoming students with whom he worked on matters of admission. Since his retirement in 1936, Dr. Tryon has kept up close relations with the Institute itself and with many of the men who remember his friendly guidance in the starting of their Institute careers.

Frederick G. Hartwell, who also became an honorary member of the Association at the banquet, returned to Technology as acting superintendent of buildings in 1918, having served as electrician for the years from 1902 to 1908. After 10 years as assistant superintendent of buildings, from 1919 to 1929, Mr. Hartwell became manager of the Dormitories and Walker Memorial, in which post he served faithfully until his retirement in 1942. As manager of the Dormitories, Mr. Hartwell had firsthand acquaintance with a good many college generations of Institute students; seeing them through from the first frenzies of freshman fears and foibles to the august austerity of senior serenity. His induction as an honorary member of the Alumni Association thus came as a friendly return gesture.

. . . *The State of Affairs* . . .

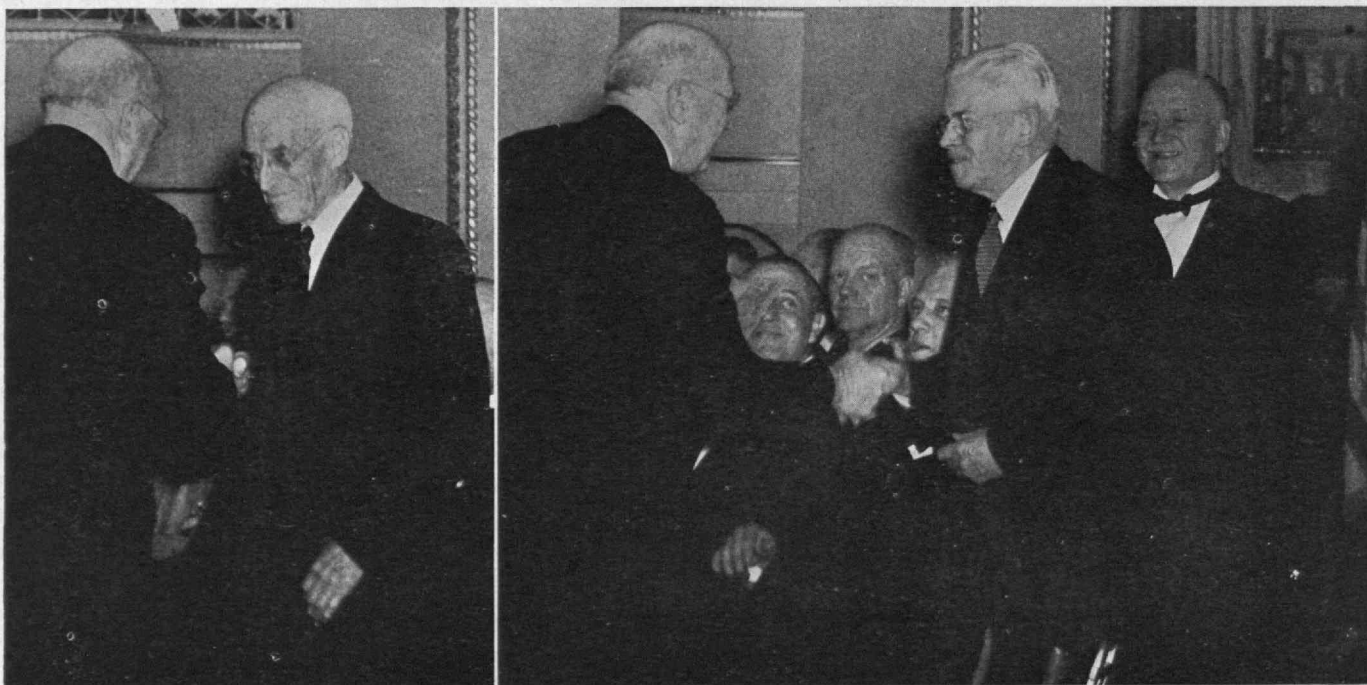
The industrial power of the United States as a vital weapon in the prosecution of the war, and the steps that must be taken in future years to assure the restoration

of economic stability, were considered from different points of view by the two principal speakers of the evening. Paul G. Hoffman, chairman of the Committee for Economic Development, in an address published elsewhere in this issue of *The Review*, discussed a series of proposals for the establishment and maintenance of employment as a basis for prosperity once the war is won. President Compton, in his annual review of the state of the Institute, emphasized the relationship between technological education and industry, pointing out parallel problems and analyzing the sacrifices of later objectives which must be made in the immediate task of wartime responsibilities. Dr. Compton's address follows:

Your presence in such large numbers at this annual Alumni Dinner is an encouragement to us who are here on the job, and I know that it is a source of inspiration to you to renew acquaintances with each other and with the Institute.

Our Executive Vice-president, James R. Killian, Jr., '26, recently addressed the local chapter of the Society of the Sigma Xi and described the wartime activities of the Institute under the intriguing title, "The Little Red Schoolhouse." He showed how the stupendous advances in technology and the pressure of wartime requirements had expanded our institution into an enormous beehive of activities requiring a type of business management unprecedented in the history of educational institutions. He showed at the same time that the basic purpose, spirit, and value of the Institute of today rest upon the same fundamental ideals as those which so profoundly influenced our forefathers in their little red schoolhouses. However complicated technology may become, let us steadfastly see to it that the ideals of unselfish public service, of a personal ambition to fit ourselves as effectively as possible for the demands of life, and of that rare combination of democratic independence and co-operative teamwork shall be maintained.

In this time of war emergency, it is becoming increasingly clear that a major asset of these United States is their industrial power to produce more and better weapons than those which are available to our enemies. Most of you who are not actually in the armed services are engaged in the wide variety of industrial enterprises which are feeding our war economy.



M.I.T. Photo

Two longtime friends of M.I.T. men were inducted into honorary membership in the Alumni Association at the banquet: At the left, President Chesterman welcomes to membership James L. Tryon, Professor Emeritus, from 1930 to 1936 Director of Admissions; at the right, Frederick G. Hartwell, long manager of the Dormitories and Walker Memorial, is inducted into membership, to the approving smile of Secretary Locke.



M.I.T. Photo

Its gold star memorializing 49 Institute men who have lost their lives, its blue star representing 5,501 Technology men now in service, this service flag was presented to the Institute by the Alumni Association at the banquet. The 49 Alumni for whom the gold star stands: Henry P. T. van Keuren, '07, captain, U.S.A.; Carl H. Morrill, '12, captain, U.S.A.; Robert E. de Merritt, '16, colonel, U.S.A.; Thomas F. O'Brien, '17, captain, U.S.N.; Howard S. MacKirdy, '19, colonel, U.S.A.; Robert F. Morrison, '19, lieutenant colonel, U.S.A.; Howard R. Healy, '21, lieutenant commander, U.S.N.; Alfred J. Lyon, '21, brigadier general, U.S.A.; Isaac Brimberg, '24, major, U.S.A.; F. Gurney Fine, Jr., '26, captain, U.S.A.; Norman C. Estes, '28, lieutenant commander, U.S.N.; Olcott S. Payson, '30, lieutenant, Ferrying Command; Gordon K. Parks, '32, lieutenant colonel, U.S.A.; Robert M. Emery, '34, lieutenant, U.S.A.; Harry E. Hubbard, '34, commander, U.S.N.; Harold F. T. Davies, '35, sublieutenant, R.N.V.R.; John D. Gardiner, '36, captain, U.S.A.; M. Murray Waxman, Jr., '36, lieutenant, junior grade, U.S.N.; Robert E. Williams, Jr., '36, major, U.S.A.; John H. Gander, '37, major, U.S.A.; Arthur L. Dionne, '38, ensign, U.S.N.; John H. Eakin, '38, lieutenant, U.S.A.; Fred L. Lamb, '38, lieutenant, U.S.N.; Charles R. Mills, '38, captain, U.S.A.; James M. Topalian, '38, corporal, U.S.A.; John W. Jackson, '39, lieutenant, U.S.A.; Clare A. McRoberts, '39, flight officer, R.C.A.F.; Delavan B. Downer, Jr., '40, ensign, U.S.N.; Henry W. Hurley, '40, lieutenant colonel, U.S.A.; George R. Smith, '40, lieutenant colonel, U.S.A.; George R. Stone, '40, lieutenant commander, U.S.N.; Horace J. Adelson, '41, lieutenant, U.S.A.; John R. Bird, '41, captain, U.S.A.; James H. Cooke, '41, lieutenant, U.S.A.; William S. Doughten, Jr., '41, lieutenant, U.S.A.; James H. Ferguson, '41, lieutenant, U.S.M.C.; Donald W. Augusterfer, '42, ensign, U.S.N.; Allan R. Bardwell, '42, second lieutenant, U.S.A.; Francis M. Costello, Jr., '42, lieutenant, U.S.A.; Arthur Dzendolet, '42, lieutenant, U.S.N.; Bradford K. Herman, '42, lieutenant, U.S.A.; Cutler Jones, '42, ensign, U.S.N.; Charles F. Kelley, Jr., '42, captain, U.S.A.; Harold J. Klopp, '42, ensign, U.S.N.; Charles F. Leiserson, '42, ensign, U.S.N.; Robert E. Manders, Jr., '42, R.C.A.F.; James W. Pflueger, '42, lieutenant, U.S.A.; David W. Stamper, '42, lieutenant, U.S.M.C.; and Matthew Mank, '43, sergeant pilot, R.C.A.F., attached to the R.A.F.

It therefore seems appropriate that I should use the analogy of industry in pointing out to you some of the aspects of the Institute's present activities and problems.

The flow sheet of a typical industrial enterprise would show a stream of raw materials going from their sources to the factory; it would show them being processed within the factory to make the finished product; it would then show them flowing out of the factory into the channels of sale and distribution. In our institution, we have an exactly analogous situation.

Normally, our raw materials are the civilian students who come here as undergraduates or postgraduates, to be processed into an improved technological product. The influence of our Alumni, the advertising power of the reputation of the Institute, the activities of our Honorary Secretaries, and many other influences give rise to this normal flow of civilian students to the banks of the Charles River. Under our system of stabilized enrollment, which is inherently determined by the processing facilities within our plant, we normally regulate the inward flow in such manner that we have approximately 2,400 undergraduate students and 700 postgraduate students in any one year.

. . . Changes Forced . . .

As you know, the war has forced a very great change in this aspect of our activities. At the beginning of the academic term which came to a close in February, we had about 1,470 civilian students, 1,178 Army students, and 981 Navy students, exclusive of certain special courses. We estimate that we shall begin the present term with 851 civilian students, 924 Army students, and 645 Navy students, or a total reduction from 3,629 to 2,420. The influences which bring about this change are too well known to require comment.

Turning now to the processing phase, which is the program of academic studies at the Institute, we find in the first place that a part of our processing program is set for us by curricula

that have been established by the Army and Navy agencies on a uniform basis throughout the country. If we can do a better job of teaching this curriculum than some of our competitors, we can hope to turn out a better product. The curricula have in general been well conceived and generally meet in spirit if not in detail our regular academic standards. As to that portion of the curriculum available to civilian students, there has been no essential change in either quality or content as a result of the war, except that a few of the more highly specialized courses have had to be discontinued. The principal change in our processing program is that we have gone onto three shifts instead of two shifts.

Some change has occurred in the personnel, whom we call the "Faculty" but whom you might call the "workmen in the shop." The total number has not changed greatly. For example, it is now 625 in number as compared to 683 in November, 1939. This slightly reduced staff is teaching a considerably larger number of students and is carrying a much heavier teaching schedule, and it has very largely abandoned its activities in research and advanced study. Some of the present members of the staff have been temporarily recruited to meet the emergency arising from the fact that approximately 20 per cent of our regular staff are devoting all or a major portion of their time to special war projects, some of them working on war projects at the Institute and more of them being engaged on war jobs elsewhere.

Considering the disposition of our product, I should say at once that in these days we have no difficulty in making sales. For every good man who is available, many jobs are waiting. For example, I see by the papers that the draft boards are about 200,000 men short of their quotas. Granted physical fitness, the armed forces are one place where there is no doubt of the ability of any M.I.T. man to find work. In addition, industry and special nonuniformed war services as well as teaching in many subjects are all desperately in need of personnel. So, our sales job is now vastly different from what it was 10 or 12 years ago when

The 5,501

The 5,501 M.I.T. Alumni whose service in the armed forces of the United Nations as of February 26 is represented by the blue star in the service flag presented by the Alumni Association to the Institute on Alumni Day are distributed as follows:

Class	U.S.A.	U.S.N.	U.S.C.G.	U.S.M.C.	Allied	Total
1895	1		1			2
1896	2		1			3
1897	1		1			2
1898	2	1				3
1900	1					1
1901	2	2				4
1902	5	1	1			7
1903	2					2
1904		1				1
1905	5	6				11
1906	6	3				9
1907	8	5				13
1908	4	6				10
1909	8	4	1			13
1910	19	7				26
1911	18	2	1			21
1912	12	6				18
1913	14	5			1	20
1914	13	6		1		20
1915	12	6				18
1916	26	10	1			37
1917	35	31	2			68
1918	26	10				36
1919	22	9				31
1920	32	32		2		66
1921	102	38				140
1922	90	46	1	1	1	139
1923	89	52	2	1	2	146
1924	68	46		1	1	116
1925	72	44		1	1	118
1926	67	41	1	1	1	111
1927	73	30		1		104
1928	80	58			3	141
1929	66	39	3		2	110
1930	108	52		1	1	162
1931	115	54	1	1		171
1932	135	66	2	1	3	207
1933	139	74	2	5	2	222
1934	156	62	2	4	3	227
1935	154	44	2	2	2	204
1936	136	68	3	1	5	213
1937	159	54		2	2	217
1938	180	64		3	1	248
1939	190	73	2	3	5	273
1940	247	120	5	5	6	383
1941	282	169	5	5	2	463
1942	391	190	3	9	10	603
1943	167	157	3	10	4	341
Totals	3,542	1,794	46	61	58	5,501

we had to put on special activities to assist and to train men to secure jobs in the depths of the late depression.

Before leaving this discussion of the flow sheet of our product, I should like to make one comment. Just as any industry, we operate with a certain amount of competition with other institutions of similar and different types. There is keen competition for the raw material, keen competition for the product, and keen competition for the workmen. Our sale price, which is the tuition,

has to bear some workable relationship with the tuitions charged by our competitors, and the tuition which we can maintain is determined by the quality of our product. The better the raw material which we admit to our classrooms and the better the educational program which processes this raw material into Alumni like yourselves, the more we can properly charge for the processing job in this competitive field. Conversely, the quality of the job which we can do is in a very fundamental manner related to the quality of our academic staff and this in turn to the salaries which we can offer in this competitive field.

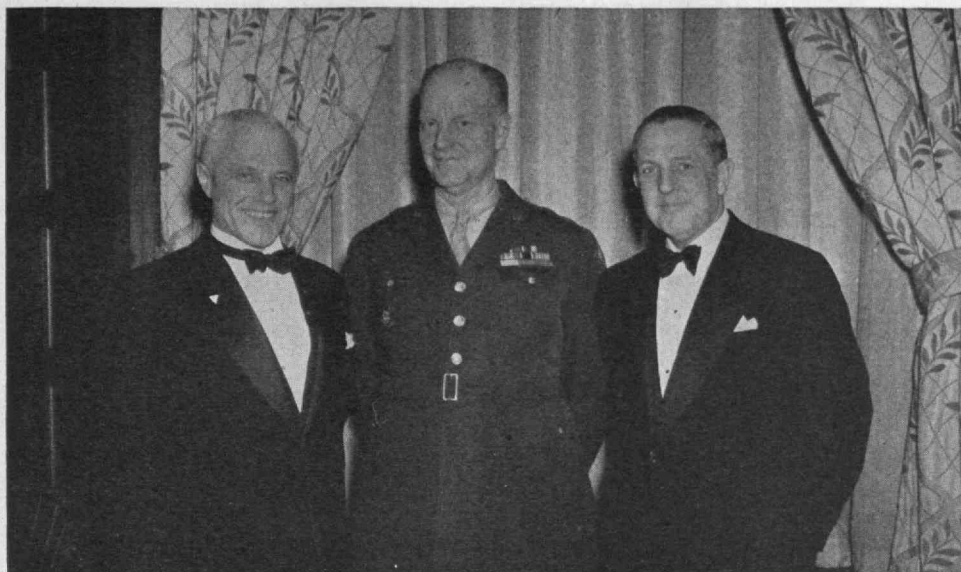
. . . The Chief Problem . . .

Just as Switzerland, for example, in spite of its relative dearth of any rich natural resources except air and mountains, has been prosperous and famous because of the fact that it has chosen skillfully to manufacture products like watches and precision instruments the value of which is enormously enhanced by the quality of workmanship put into them, so the Institute has chosen the course of turning out a high specialty product of finest quality. I consider that by far the most important problem before the governing bodies of this institution is to maintain this quality at the highest possible level. To do so means that we must maintain a staff of the finest caliber, that this staff must work together as an efficient and enthusiastic team, that our technological processes of education and research must be kept at the highest level and at the very forefront of technological progress, and that we must continue to have good raw material flowing into our plant. As I see the problems which are likely to face this institution after the war, the problem of ways and means and skill and energy to maintain and further improve these qualities is far and away the most important of all.

Having discussed the flow sheet of material through our plant, let us turn next to the other important sheet to which attention must be given by every industrial organization and also by us. I refer to the balance sheet. In an industry, one side of the ledger shows the cost of raw materials, the manufacturing costs, the sales costs, and the money which is put back into the business in the form of plant, good-will advertising, and research. The other side of the balance sheet shows the income from sales and services. Out of the difference between these two, taxes have to be paid, and whatever is left over is profit.

We in the Institute have a similar business problem. The raw materials generally come to us of their own free will, though we do have minor costs in advertising and recruitment. Similarly our sales costs are not large, for the buyers come to us and the products sell themselves—at least in good times—although we do maintain a very useful Placement Bureau. By far our major costs are those of the manufacturing operation, or, in other words, the cost of operating the educational program within the Institute. We do occasionally put back something into our plant, and we put a little into good-will advertising through our publications and visits of staff members to clubs, industries, educational institutions, and the like. We put quite a lot back into our business in the form of research, which is on the one hand a significant part of our educational process itself and is on the other hand an important factor in maintaining our operations in the front line of technological progress.

As regards income, we get none from sales. Our income from services is of two types, the major part of course being in the form of tuition and a minor part coming from the service to industry carried on under our Division of Industrial Cooperation. Beyond these two sources of income, we get gifts for operating expenses and we get endowment whose income may be used for the same purpose. In these two categories we differ from an industrial organization. To a large extent, the gifts and the endowment have made our Institute of Technology great, because without them we could not have attained the prestige and effectiveness which have enabled us to specialize in technological education of superior quality.



President Compton with General Miles and Mr. Hoffman on the evening of the Alumni Banquet.

M.I.T. Photo

. . . Marked Difference . . .

When we come finally to make up the balance sheet, we differ markedly from industrial organizations, first in the fact that we have to pay no taxes and second in the fact that we declare no dividends. Thank God for the absence of taxes! If we were subject to them, we should either go out of business or become too second rate to be a source of pride or value to this or any other community. This statement holds not only for us but for all other educational institutions. As to profit and loss, I suspect that we have a record which would be truly remarkable for any industrial company. I estimate that since the beginning of the Institute, our aggregate operating income has been somewhere between \$200,000,000 and \$250,000,000, perhaps more; yet our profit-and-loss account is measured within probably ten thousand dollars or thereabouts, and nobody has ever made a penny out of the institution except by hard work for a very modest salary as a member of its staff.

Before leaving the subject of the balance sheet, I would say that our budget for the current year appears to be just about balanced, plus or minus a very few thousand dollars. Looking ahead to next year, our present estimate is for a deficit of about \$225,000 on account of the expected considerable reduction in the number of students as a result of changes made necessary by the war. But this is only a rough estimate at present; our whole experience of the last few years illustrates very vividly that "sufficient unto the day is the evil thereof" and "no one knows what tomorrow may bring forth." Still on the financial side, let me say that one of the most heartening experiences of the last four years has been the manner in which you of the Alumni have established the Alumni Fund program on an ever growing basis in spite of the world conditions which made the inauguration of such an enterprise particularly difficult. For the year 1943-1944 we have approximately 8,850 contributors and have received \$116,000. Starting only very recently in this activity, our Alumni Fund now stands sixth among all the college or university funds in the country, both in number of contributors and in amount contributed. Henry B. Kane, '24, and his agents in the Classes and Clubs have our appreciation and thanks for the way in which they have developed this program. There is still room for improvement. Our Alumni President for 1941-1942, B. Edwin Hutchinson, '09, felt convinced that the Fund should have reached a total of \$150,000 a year by this time. This goal has not been reached. Hence, though we can feel some satisfaction, we cannot be complacent, and I wish to urge upon all Alumni that there is no one way in which they can more effectively repay to the Institute whatever they may owe it for their degree of success in life, and no way in which they can make a

finer contribution to the prosperity of the country in a most fundamental manner, than by their contributions to this Fund, which will enable the Institute to go still farther in the direction of maintaining the highest quality of education and advancing knowledge in the technological fields for which there will be so enormous an opportunity, especially in the years to come as we recover from the ravages of this war and make an effort to achieve a sustained and ever increasing prosperity and satisfaction for the people of this country.

. . . Special Activities . . .

Let me now say just a few words about some of the special activities of a noneducational type in which the Institute is engaged as a part of its war service. These have already been described in print on various occasions, and I wish now only to mention them in order to recall them to your minds and put them on the record.

Outside of our distinctly educational program, the major service of the Institute has been in connection with war research and development in the field of new weapons, materials, instrumentalities, and devices of warfare. This work has been handled on the business side through our Division of Industrial Cooperation, which is now operating 51 contracts with the Office of Scientific Research and Development, 65 contracts with other governmental agencies including the Army and Navy, and 73 contracts with industrial companies, or a total of 189 contracts. These current contracts have an aggregate volume of approximately \$22,000,000 and involve the employment of about 3,400 people. To house these projects we have had to expand our laboratory facilities by nearly 20 acres of floor space, some of which has been borrowed, some rented, some built by our own funds, and some built in the form of temporary buildings by government funds under the contracts. When the story can be told of the accomplishments of these laboratories and their use in the various theaters and phases of the war, it will be an exciting story of which every Technology man and every man who has co-operated in these projects on leave of absence from other institutions or industrial companies can be very justly proud.

In connection with these research and development projects and also in connection with the contracts under which our various educational programs are carried on, we have had occasion to deal in a legal and business way with government agencies in a manner which I suspect may compare rather well with the similar activities of large industrial concerns which also are engaged on government contracts. We have had to develop a policy in regard to patents; we have had to deal with government auditors; we have had to come to a definition of overhead

and a working understanding of what is meant by "no profit, no loss." Moreover, we have had to exercise extreme care lest some slip or oversight in these contracts might endanger the whole financial structure of the institution, since the aggregate value of the contracts from the beginning of the present war activity is comparable to the total endowment of the institution, and an unfortunate error of even a few per cent of the total value of the contracts could very easily do great damage to the Institute. I am glad to say that these situations have been exceedingly well handled both by our own representatives and by those government officers with whom we have had to deal. I would pay especial tribute to my colleagues — our Executive Vice-president, Mr. Killian; our Treasurer, Horace Ford; the Director of our Division of Industrial Cooperation, Nathaniel McL. Sage, '13; our legal counsel, Phillips Ketchum; and a considerable number of their colleagues who have worked hard and skillfully and with great devotion to the placing of this aspect of our work on a high and safe plane.

. . . Research . . .

I think you may be interested in the over-all breakdown of these research and development projects at the Institute for the year ending June 30, 1944, in which the balance of the year is estimated with very considerable certainty. Of the total of about \$22,000,000, 43.3 per cent goes into materials and services, 37.8 per cent into salaries and wages, 6.3 per cent into buildings, 6.6 per cent into overhead, and the remaining 6 per cent into miscellaneous items. The fact that the item of overhead is only 6.6 per cent might at first sight be astonishing to anyone acquainted with the importance of this item in an industrial operation. The fact that it is so low is accounted for by a number of factors: In the first place, we have not counted into overhead those expenses in which the Institute would have been involved in the absence of the contracts. Putting this in another way, we have not tried to unload upon these government contracts any of the normal costs of operating the institution but only the clearly proportionate share of expenses incident to the undertaking of the new work. In the second place, a considerable portion of the expenses of some of the largest projects, which in ordinary circumstances would be called overhead, are actually charged and billed at cost as direct expenses and therefore are not included in overhead. Even with these two factors, I think it can surely be said that the overhead item could not have been kept to such a low figure except by the devoted and efficient administrative work of my colleagues.

Outside of the teaching programs and the research and development programs, the outstanding remaining contribution of the Institute to the war effort has been the advisory services of many members of its staff to the Army, the Navy, the Office of Scientific Research and Development, the National Advisory Committee for Aeronautics, and other important agencies. I am sure that I can say truthfully that there is no institution which



M.I.T. Photo

" . . . The thought of these sacrifices should gird us all to renewed effort to bring the war to the quickest possible successful conclusion. . . . " Dr. Compton speaking at the Alumni Banquet.

has proportionately been more influential — perhaps I had better say, has tried harder to be — or whose services have been more valuable than the Institute through its staff and Alumni.

Just as soon as this war is over, I trust that an immediate program will be undertaken to secure from every Alumnus and every member of the staff a record of his war service in order that these records may be secured before memories are dimmed and access to the records is lost. Then there will be an opportunity, which the Alumni Association may wish to grasp as it did after the last War, of preparing a permanent record setting forth the contributions of Technology in this period of national and world emergency.

. . . Sacrifices . . .

In conclusion, I should like to point out that the contributions of the Institute and its staff to the war effort have not been made without some very distinct sacrifices. Some of these sacrifices are obvious — as, for example, the personal sacrifices of those engaged in the work. These sacrifices involve not only the men and their professional careers but also to a very large extent their families. This is a type of sacrifice which we share with those in the armed forces and all others (*Continued on page 381*)



M.I.T. Photo

Alumnae were on hand for the festivities of the evening, among those present being, from left to right, Lieutenant Marion Coes Kenney, '18, Harriet Gallup de Lancey, '94, Anna B. Gallup, '01, Adelaide Toombs, '42, and Charlotte Simonds Sage, '13.



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His job is one of the earliest in a long series of operations which bring a melt of Allegheny Ludlum stainless, electrical or other alloy steel to its final form, rigidly true to specifications. His experience determines whether the molten mass within the furnace is progressing at the proper rate, and dictates any adjustments necessary to produce the quality of steel specified.

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For, in wartime especially, the properties of alloy steels must be maintained with the utmost consistency. Lives of men—even the outcome of battles depends upon this uniformity, because the place of alloy steels is always in the vital heart of a war mechanism.

Lives and battles depend upon other things in this war, too—matters that come home to every house-

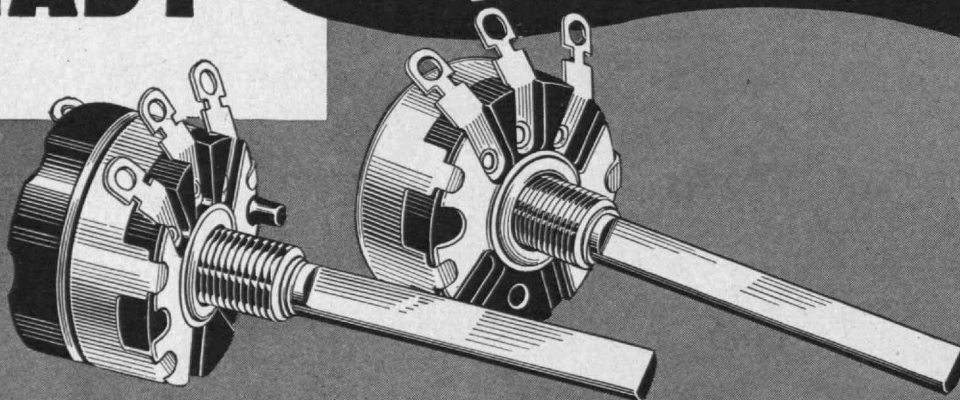
hold. Buying bonds, conserving food, fuel, gasoline, rubber, waste fats and scrap metal—all these have to do with how soon the war will be won, and at what price. They are *everyone's* jobs. Have you done—are you doing—all you can?



Allegheny Ludlum
STEEL CORPORATION
BRACKENRIDGE, PENNSYLVANIA

IRC WILL BE READY

with **WIRE WOUND
POTENTIOMETERS**



At war's end, IRC will be prepared to furnish ample quantities of resistors of *all types* to meet Industry's post-war needs.

That these IRC units will be available on a mass production basis is due to the fact that, in meeting war requirements, we have developed the Nation's largest resistor plant using the most improved and efficient types of specialized equipment.

ENGINEERING HELP FOR YOU

At your service on any resistance problems involved in your peacetime product design plans is our Engineering-Research staff. You may be assured that all projects discussed with this department will be held in strictest confidence.

FEATURES OF IRC WIRE WOUND POTENTIOMETERS (TYPE W)

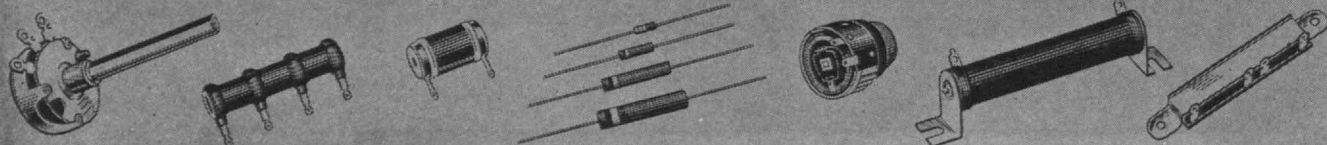
1. *Tight uniform winding on specially processed bakelite.*
2. *Uniform contact pressure which can be adjusted to meet application requirements.*
3. *Welded resistance wire terminations.*
4. *Only one wiping contact-clock spring between center terminal and contact arm.*
5. *Designed for maximum stability under conditions of vibration and shock.*
6. *Available as duals and triples in combination with composition controls.*



INTERNATIONAL RESISTANCE CO.

401 N. Broad St. Philadelphia 8, Pa.

IRC makes more types of resistance units, in more shapes, for more applications than any other manufacturer in the world.



COPPER

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MINE

to

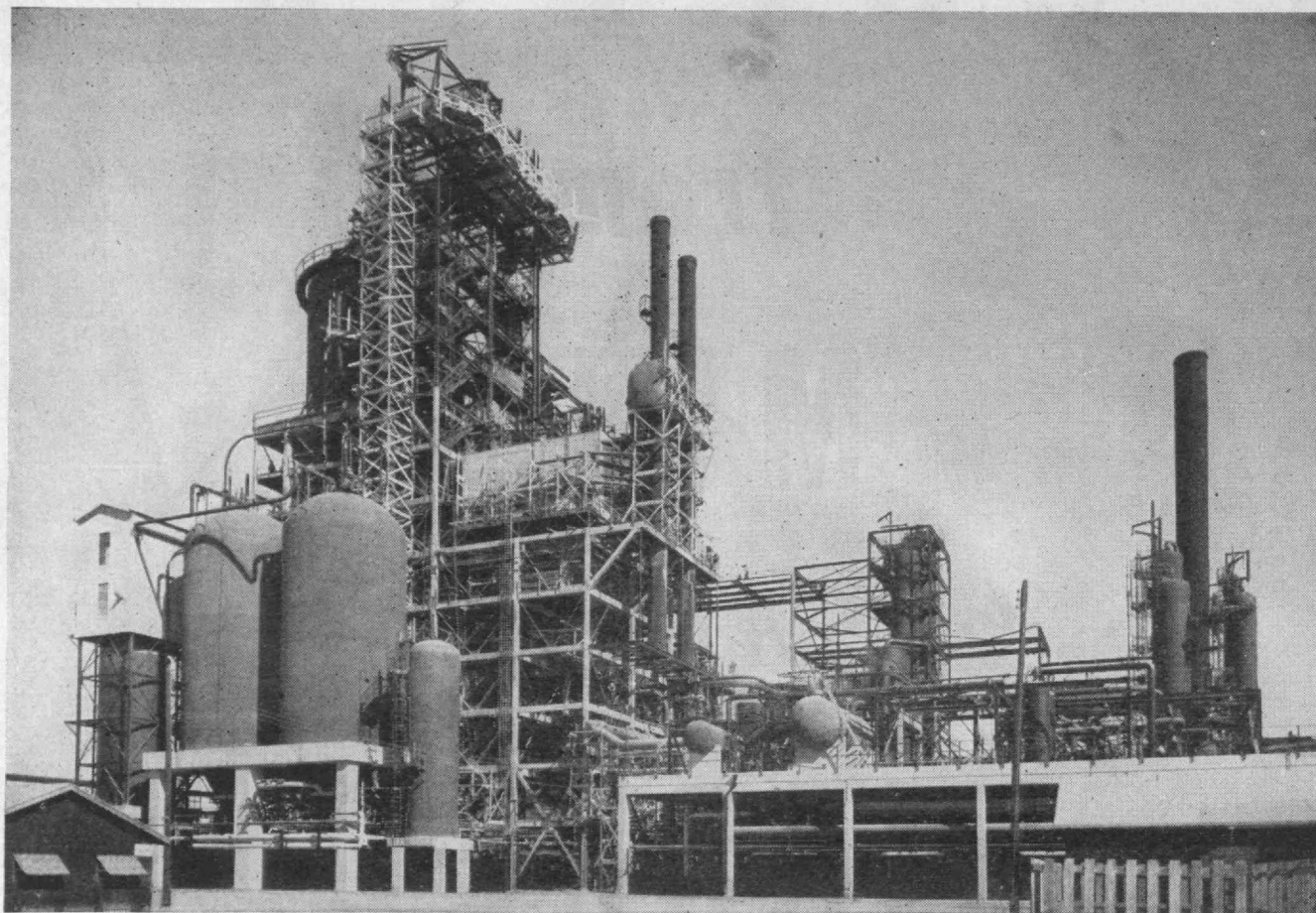
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PHELPS DODGE COPPER PRODUCTS CORPORATION

GENERAL SALES OFFICES: 40 WALL ST., NEW YORK

MILLS: Bayway, N. J. • Yonkers, N. Y. • Fort Wayne, Ind. • Los Angeles, Calif.



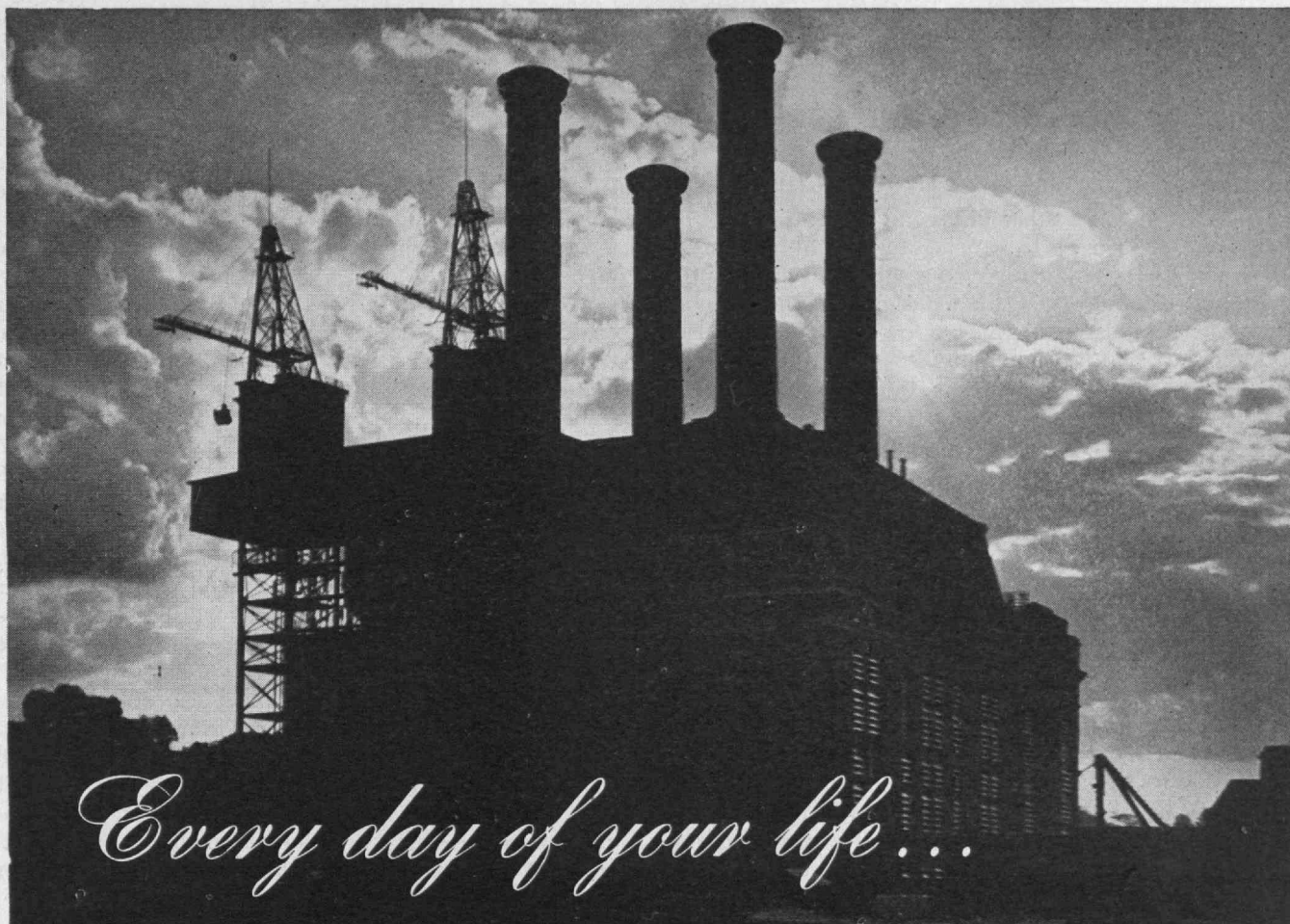
The Gas Behind the Plane

This new fluid catalyst cracking unit was dedicated at Texas City, Texas, on March 9, 1944. With other new facilities, it produces enough 100 octane aviation gasoline a week to power a 1000 four-engine bomber raid on Berlin from England.

It is a monument to a miracle which started in classrooms and Institute "labs." Because of the vision, persistence and unceasing labors of scientists, this nation had a fuel that enabled us to build the fastest, most rugged aircraft in the world.



AMERICAN OIL COMPANY *and its affiliate* PAN AMERICAN REFINING CORP.



C-E Equipment serves you in one way or another

You may know nothing about Combustion Engineering or its products but the probabilities are that they help to supply many of your daily needs—the food you eat, the clothes you wear, the car you'd like to be able to use more freely and, ranking high among the things you take for granted, the electricity you summon to your instant service by the push of a button or the flick of a switch. For all these and countless other items that figure importantly in your daily life require power or heat for their manufacture—and major producers in every field rely on C-E steam generating equipment to produce this power and heat.

But today C-E equipment is performing a service for you more important than any of the conveniences or even necessities of your daily life. Deep in the hulls of many hundreds of ships, C-E boilers are supplying the steam power to take precious

cargoes of men and supplies to their destinations on every front. Nothing is more important to a ship than the power to move at will, and C-E boilers are supplying that power for new ships exceeding in tonnage this country's entire pre-war merchant fleet. Add to that the service performed by thousands of C-E boiler units in industrial plants manufacturing every variety of war materiel and we think you'll agree that C-E equipment, as the source of a substantial part of the steam required for both our civilian and war needs, is serving you and all Americans.



C-E installations span the whole range of steam generating requirements from small stoker-fired boilers of less than 50 horse power to the largest power station units.



Combustion Engineering Company Inc.

200 MADISON AVENUE, NEW YORK 16, N. Y.

MAN AND HIS MACHINES

(Continued from page 328)

will make little difference what new machines are discovered in the next 50 years if we cannot somehow exterminate these prejudices and enmities. If we could do as much to eradicate poverty and provincialism as we have done to abolish tuberculosis and diabetes, we should indeed be on our road to Utopia. If we could by painless injection, as we now employ the sulpha drugs, kill the germs of racial antagonism, we could be a little more hopeful of a parliament of man, a federation of the world.

I am not recommending that you, as the youngest graduates of this respectable institution, should set out tomorrow to reform your home towns. If you did, you would soon be lonely and unhappy. But I am counseling you to keep your interests broad, to study public affairs, to concern yourselves at intervals with the people around you. It is tremendously important that men and women like yourselves, with such tools at your disposal, should use them for the welfare of mankind. And if you seek models of what scientists should be and do in times of crisis, you have only to look at the three able college Presidents from this area who have recently been contributing so much to the government: Leonard Carmichael, the psychologist; James B. Conant, the chemist; and your own Karl T. Compton, the physicist.

We once had, indeed may still have, in the Presbyterian church, a question in the catechism, "What is the chief end of man?" My listeners, if any, will have various answers, according to their moods and characters. The answer is not professional success or wealth or fame, desir-

able though these may be. Perhaps it is not the same for everybody. But I should like to offer a hint from the standpoint of a schoolmaster who believes that the arena as well as the ivory tower should be the scientist's bailiwick. The chief end of man is to develop to the maximum his appreciation of the True, the Beautiful, and the Good; to employ his talents so that the world will be the better for his having lived in it; and to fulfill to the utmost his moral obligations to his neighbors and the higher law.

A tale is told of Daniel Webster which taxes our credulity but which I have verified from several sources. Once at a dinner in the Astor House in 1850, the great orator was apparently so self-absorbed that he would not respond to the attempts of his companions to lure him into conversation. At last one audacious spirit summoned up courage and asked, "Mr. Webster, I want you to tell us the most important thought that ever occupied your mind." The situation under some conditions might have become ridiculous, but Webster treated it very solemnly. Turning to his neighbor, he passed his hand across his forehead in his favorite gesture and whispered, "Is there anyone here who does not know me?" "No, sir," was the reply. "They all know you. They are all your friends." Meanwhile the company remained expectantly silent. Then, straightening up and throwing off his lethargy, Webster began, in those tones which never failed to thrill those who heard them, "The most important thought that ever occupied my mind was that of my own individual responsibility to God!" According to the testimony of those present, he addressed the gathering for

(Continued on page 356)



P O O R & C O M P A N Y
CHICAGO

Manufacturers of Railway Equipment used by Railways throughout the world

Every branch of the Armed Services uses the telephone. No. 10 of a series, General Staff.



At Field Headquarters sits a staff officer—telephoning. In his hands, this familiar instrument, now a weapon of war, controls the striking power of our forces in the whole area of combat. Over it flow the orders that will drive back the enemy till the final order—"Cease Firing"—is flashed to every front.



Won't YOU help them lead our men to Victory?



75th ANNIVERSARY

Western Electric

IN PEACE...SOURCE OF SUPPLY FOR THE BELL SYSTEM.
IN WAR...ARSENAL OF COMMUNICATIONS EQUIPMENT.



The ablest officers and the bravest men can win this war only with your full support. They must have weapons, food, supplies—more and more and MORE of them. Make sure they get them. Buy War Bonds, more War Bonds and STILL MORE!

MAN AND HIS MACHINES

(Continued from page 354)

about 20 minutes, obviously under the influence of deep emotion, and then rose from the table and retired to his bedroom. Probably not a man living except Webster could have dominated a group like that. The occasion was all the more memorable because it later appeared that Senator Webster was then planning his Seventh of March speech, which postponed the Civil War for a decade, and his responsibility as a statesman was weighing heavily upon him.

Some such moral responsibility we must all of us feel in these days when the destinies of mankind seem to be hanging in the balance. He must be stolid indeed who can watch what may be the Twilight of the Gods without being gravely concerned. The scientist today, even in his laboratory, cannot evade thinking of the social problems which face us — the problems of poverty, of starvation, of unemployment, of maladjustment, of class antagonisms, of pressure groups, of individual selfishness and corruption. These are responsibilities which we all must face, no matter what our vocations, and we cannot meet them by inventing new machines. The only solution for them starts with sympathy, with a lofty idealism transmuted at the right moment into positive action.

On June 21, 1883, at the Phillips Exeter Academy, the two chief speakers were Benjamin F. Butler, then Governor of Massachusetts, and Charles William Eliot, President of Harvard College. Butler, an avowed materialist, said in his prepared speech that the man who built the Brooklyn Bridge was more to be admired than

he who created a great poem or sonnet; that the future of the world lay with scientists, who dealt with what Kipling was later to describe as "iron, cold iron, the master of men all"; and that the practical man of affairs was superior to the artist or the dreamer. When President Eliot arose, he deliberately cast aside his manuscript and, with that fluency for which he was even then distinguished, took up the theme of his predecessor. Himself a chemist of note, he said with his customary vigor and sincerity:

While I desire to express my adhesion to much that His Excellency has said, let me also add that I believe the students of this Academy should look to it for something higher than mere scientific training. What is it that you must learn here which will always be above all literature and all science, powerful though science may become? You must learn the eternal worth of character; you must learn that the ultimate powers of the human race lie in undying instincts and passions; you must learn that above all material things is man — the thoughtful, passionate, and emotional being, the intellectual and religious man. . . . And, believe me, the supreme powers of this universe are not mechanical or material; they are hope and fear and love.

Here, out of the past, is a ringing message from a great scientist to you, the scientists of a younger generation. I, who am neither a scientist nor a preacher, would urge you as your immediate duty to do all that you can to win this war — to make, as you are making, every effort to surpass the enemy in skill and ingenuity. This is now your primary responsibility, and you have been well trained to marshal our material resources in the cause of all the freedoms. But some day, please God, the emer-

(Concluded on page 358)

Two New England Companies

Boston INSURANCE COMPANY



Incorporated 1873

For 70 years this Company has rendered un-failing service to the public — from insuring clipper ships to vast industrial plants and civilian properties throughout the country.

Old Colony INSURANCE COMPANY



Incorporated 1906

The emblem of the Mayflower signifies the essential integrity of the Company's New England background. Through the years, it has maintained unassailable financial strength.

HENRY R. HEDGE, '96, *President*

Home Office: 87 Kilby Street, Boston, Massachusetts

DO YOU WANT TO STOP THIS KIND OF WASTE?

Obviously, you wouldn't welcome fire's destructiveness—particularly if you are carrying the cares of war production and of manpower and materials shortages. Loss of your vital key processes or plant facilities would be more serious today than ever, and would throw a heavy extra burden on management.

Fortunately, you need not take on this burden, because industry has learned how to apply engineering methods which prevent and control fire hazards at the source.

Long ago progressive manufacturers found that ordinary insurance could not do the job which was wanted. They therefore organized themselves to do it, and this was the start of the Factory Mutual System.

The prevention methods they developed were so successful that today the average damage sustained by this group is less than \$300 a year for each \$1,000,000 of insurance carried—a loss-rate so low that it means practical immunity. The insurance protection furthermore has been extended to include not only fire, but also fire-system leakages, many types of explosions, and wind, lightning, riot, and vandalism.

Low losses naturally give low-cost protection, but they also show the high degree of production safety enjoyed by the country's leading industries.



THIS MESSAGE SPONSORED BY THE FOLLOWING COMPANIES
OF THE

FACTORY MUTUAL SYSTEM

ARKWRIGHT Mutual Fire Insurance Co. 60 Battery March Street, Boston, Mass. *E. V. French '89, Chairman of the Board. Edward A. Barrier '05, President.*

BOSTON MANUFACTURERS-FALL RIVER MANUFACTURERS-WORCESTER MANUFACTURERS Mutual Fire Insurance Cos. 60 Battery March Street, Boston, Mass. *Waldo E. Buck '76, Pres. Emeritus (Worcester Company). Marshall B. Dalton '15, President. H. Leston Carter '08, George A. Shattuck '22, Norman E. Harris '33.*

COTTON AND WOOLEN MANUFACTURERS Mutual Insurance Co. 60 Battery March Street, Boston, Mass. *Edward H. Williams '16, President.*

FIREMEN'S Mutual Insurance Company, 10 Weybosset Street, Providence, R. I. *Frederick T. Moses '07, President. John D. Underwood '98, John M. Hanley '18, Jay E. Ricks '30, H. Bruce Leslie '38.*

PROTECTION Mutual Fire Insurance Company, 231 So. LaSalle Street, Chicago, Ill. *John L. Wilds '11, President. Robert F. Grohe '18, Laurance E. Boyden '20.*

MAN AND HIS MACHINES

(Concluded from page 356)

gency will be over. Then we can put our machines to a more productive use. Then our jeeps will help farmers to plow their fields and harvest their crops. Then your scientific knowledge can be employed through peaceful days for the betterment of mankind. And then also you may do your part to bring man nearer the standard of the machines which he has created. How? By enlarging constantly your own vision, by deepening your sympathies, by heightening your appreciation of

The light that never was, on sea or land;
The consecration, and the Poet's dream.

Above all, you can do this by meeting your social, ethical, and moral responsibilities. For the finest flower of historical evolution will be not a mechanical device, however perfect, but man himself.

WINNING THE PEACE

(Continued from page 330)

research are wholly unnecessary, for the most eloquent protagonist I know in that field is the very distinguished President of your great Institute, Karl T. Compton.

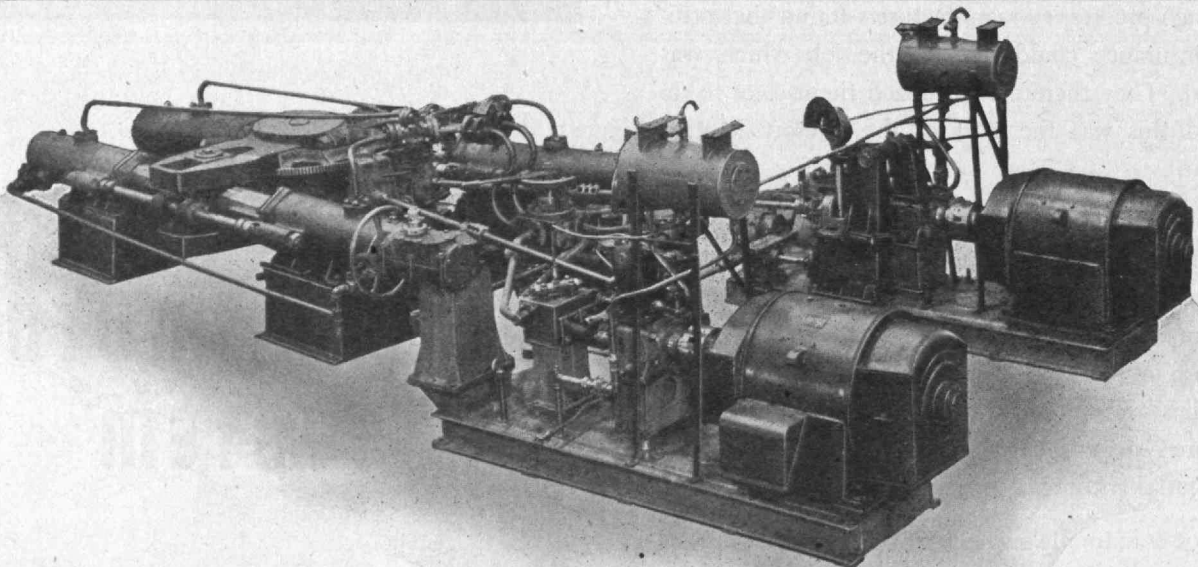
Assuming, if I may, that we are in agreement on the importance of concentrating on attaining quickly in the postwar period a vast increase in our peacetime output of goods and services, those of us in the Committee for Economic Development feel that if we are to preserve a free economy, two conclusions are inescapable: (1)

Individual enterprises must start now to plan their own postwar products and postwar markets. (2) The economic "climate" in the postwar period must be favorable to the expansion of enterprise. Not only those policies adopted as war measures but *all* policies of government, business, and labor which stifle initiative and interfere with expansion of production and employment must be changed.

Before discussing how our committee expects to make its contribution to an expanding economy, I should like to comment on several erroneous conceptions which I have found prevalent during my travels around the country. First, there is the impression that V Day is a long way off and, therefore, that we have plenty of time to prepare for the problems which peace will bring. Such thinking is utterly unrealistic. T Day, or Termination Day, has already arrived for thousands of war contractors. As of January 1, the dollar volume of canceled war contracts in this war was more than twice the total cancellations of World War I. Because government policies have not yet been determined and contractors themselves are unprepared, terminations are taking an unduly long time. If this situation is not corrected, a serious interference with the war effort may quite properly be expected to result.

Moreover, Demobilization Day is already here. Every week brings the honorable discharge of thousands of men from the armed forces. The time is here — and now — for business to organize and insist on taking care of demobilized men and helping them to realign themselves in civilian activities.

(Continued on page 360)



ELECTRO-HYDRAULIC STEERING GEAR

HYDE WINDLASS COMPANY BATH, MAINE

MAKERS OF

ELECTRIC AND STEAM WINDLASSES, STEERING GEAR, CAPSTANS AND
WINCHES: ALSO BRONZE PROPELLERS 52" DIAMETER AND OVER FOR

BOTH MERCHANT MARINE AND ALL TYPES OF NAVAL VESSELS

THERE'S ALWAYS BEEN A



War On!

In times like these, it is impossible to conduct business the way you used to. Some things are certain to be neglected.

But *one* thing you can't afford to neglect is the war against fire hazards in your plant — the war that's always on!

Fighting alone, this war against fire hazards can be a long battle . . . and a dangerous one.

But you don't have to fight *alone*.

You can join forces with the Factory Mutual System. You can get the Factory Mutuals to send trained Loss Prevention Engineers into your plant (a regular inspection service all Factory Mutual policy-holders get). And from these Engineers, you can get suggestions about eliminating fire hazards . . . installing fire-prevention equipment . . . organizing your own fire-fighting force . . . suggestions which, if adopted, may one day save you from the consequences of a disastrous fire.

• • •

For complete information about this unusual insurance service . . . particularly its *loss prevention provisions* . . . write Manufacturers Mutual Fire Insurance Company.

Hovey J. Freeman
PRESIDENT

MANUFACTURERS MUTUAL FIRE INSURANCE COMPANY

The Oldest and Largest of the Factory Mutuals
10 WEYBOSSET STREET, PROVIDENCE, RHODE ISLAND

*Over \$16,700,000,000 Insurance in Force
in the Factory Mutual Companies*

"Tech" men predominate in the more important positions of the individual companies that make up the Factory Mutual Group and of the jointly operated Inspection Department.

WINNING THE PEACE

(Continued from page 358)

V Day to most of us means that glorious day when Japan surrenders unconditionally. That's the day when we shall be entitled to do our cheering, but it's A Day that will bring the great shock to our domestic economy. By A Day, I mean the day an armistice is signed with Germany. On that day our domestic economy will be confronted with a high percentage of the problems that total peace will bring. It is essential that we be prepared to meet them. If we are not, partial peace may bring a partial paralysis of our economy. That would be disastrous not only from the standpoint of winning the peace but also from that of finishing the war with Japan in the shortest possible space of time. Confusion and chaos on the home front would postpone the day of ultimate victory.

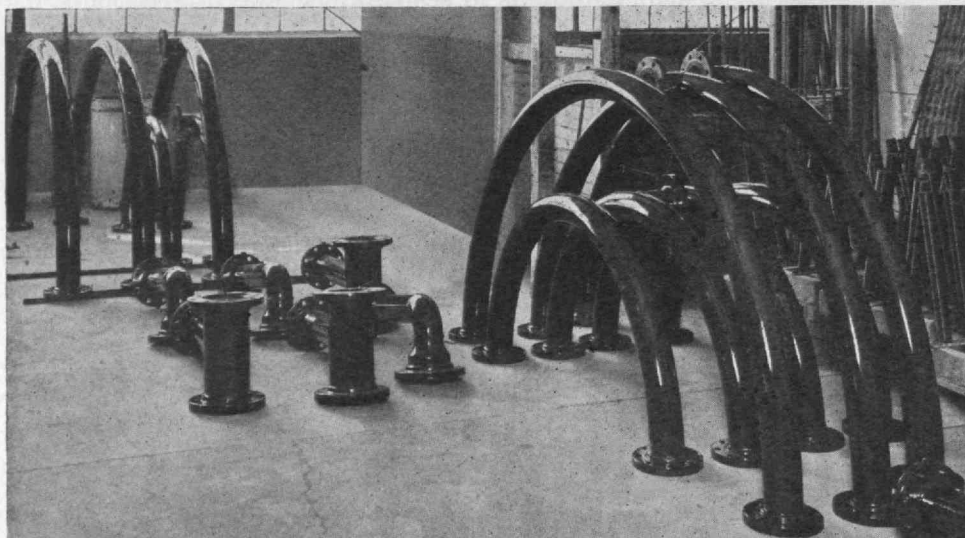
Second, I have found a dangerous belief on the part of a large number of businessmen that postwar planning is a particular function of big business — that it is not the type of activity in which smaller business can engage with profit. In view of that, I thought perhaps it might be well to take a look at what we call "business" in America, to see how many big businesses, medium-sized businesses, and small businesses we have. Nothing more than an approximation can be given because of the high mortality rate existing at the present time in small business. As a round figure, there are today something less than 2,000,000 separate business establishments (not including farms), employing one or more persons. Of these, only about 3,200 employ 1,000 or more workers

each. Some 35,000 employ between 100 and 1,000 workers, and the balance of slightly less than 2,000,000 employ fewer than 100 workers each. Significantly, those businesses employing less than 100 workers account in the aggregate for about 45 per cent of the total business employment in the United States. The statistics I have just quoted should dismiss forever any thought that big business can, by itself, win the peace. It is vitally important that small business plan and plan *now*. If our smaller enterprisers do plan, we have every reason to hope for a great resurgence of small business in the postwar period.

Third, the impression that the objectives of the Committee for Economic Development are in conflict with the objectives of those responsible for public works is erroneous. I want to say here and now that the Committee for Economic Development is fully conscious of the need for a postwar program of public works, particularly in view of the fact that during this war we have been forced to defer not only new construction but also maintenance of necessary public works projects. That need will be greatest in the immediate postwar period. Therefore, there is not a moment to lose in blueprinting public works projects at the Federal, state, and local levels. The importance of getting these projects blueprinted will be brought into sharp focus when we consider that in 1940 about 2,000,000 persons were on W.P.A. and P.W.A. We don't want another W.P.A. after this war. The bigger the shelf of public works projects we have when this war ends, the less likely are we to get another W.P.A.

(Continued on page 362)

ERIE ENAMELERS AND FABRICATORS



One of many uses in the Synthetic Rubber Industry. A smooth glass-hard surface to prevent adhesion and provide a smooth, slippery surface. Protective coatings for low friction, acid resistance, and corrosion prevention.

RESISTANT TO HEAT, CORROSION, ABRASION

THE ERIE ENAMELING COMPANY

Erie, Pennsylvania

H. E. SCHABACKER '16

J. W. VICARY '33

*"We at Colonial Value a Pound
Saved on a Plane at \$400⁰⁰"*

SAYS SIGMUND JANAS,
PRESIDENT, COLONIAL AIRLINES, INC.



"AIRPLANE manufacturers are keeping a constant look-out for practical means of reducing the empty weight of aircraft. One example of this is the uncamouflaged Boeing Flying Fortresses, now being delivered without war paint in accordance with the War Department's recent directive. This change lightens each big bomber by some 60 pounds, adds several miles per-hour speed. All this cannot be measured in terms of money. But on commercial planes, weight saved and increased revenue are synonymous. Here at Colonial Airlines, we estimate that every pound saved is worth \$400.00 throughout the first five years of the life of a plane."

**SEND FOR BOOTS
WEIGHT-SAVING BOOKLET TODAY**

Comparative weights of various types of self-locking nuts comprehensively reviewed for the convenience of aircraft designers, engineers, operating and maintenance personnel. Copy will be sent you, free, upon request.

BOOTS NUTS SAVE UP TO 60 LBS. PER PLANE

- Much lighter but tougher than other nuts.
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- Can be used over and over without the accelerated locking loss of other nuts.
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- Approved by all government aviation agencies.

BOOTS SELF-LOCKING NUTS
"They Fly With Their Boots On—Lighter"

Boots Aircraft Nut Corporation, General Offices, New Canaan, Conn., Dept. A-1.



**WING-STYLE NUTS
— IN CHANNEL**

This is one type of the famous Boots All-Metal Self-Locking Nuts—set in straight or curved channel for speed in assembly.

ARE YOU, or can you become ONE OF THESE MEN?

We are large producers of rayon yarn. In connection with our current operation and future development, we are looking for three good men. If these men could be made-to-order they would answer the following descriptions. Probably no one meets these requirements exactly, but if you match up to a reasonable degree, let us hear from you.

Man #1 A Weaving Mill Service Man.

He should be a graduate of a technical or general college, with 6 years or more practical weaving mill experience. Ideally, he would be between 30 and 40, and prepared to do field service work for us among weavers and throwsters.

Man #2 A Weaving Yarn Troubleshooter.

This man should be under 40, should have a scientific background and education in chemistry and/or physics. He should have had practical laboratory experience in connection with problems in woven goods. We'll give the right man the necessary rayon training for him to become a laboratory anchor for our field investigations.

Man #3 A New Products Man.

The ideal man for this opening should have a scientific background, especially in chemistry. He should be about 35 or 40 and have had specific experience in textiles, especially crepe yarns and fabrics. Some knowledge of textile designing would be a very desirable plus.

If you are, or believe you could become, one of these men, write to us, giving all pertinent information—personal facts, education, experience, and an idea of the salary you would expect. Even if you're currently engaged in necessary war work, let us hear from you—we are as interested in futures as you are. We will hold your communication in strictest confidence. If your letter suggests a likelihood of getting together, a personal interview will be arranged at your convenience.

Address your letter to the Vice President and Merchandise Manager, Dept. M.

INDUSTRIAL RAYON CORPORATION

New York Office: 500 Fifth Ave., New York 18, N. Y.

WINNING THE PEACE

(Continued from page 360)

Finally, among the fallacies I have encountered, I list the failure to take into proper account the potential additions to the ranks of employers in the postwar period. Much has been written—and properly so—about the millions of men who left their jobs to take up arms. Little or nothing has been said about the hundreds of thousands of employers who closed up shop and went into service. Those men, when they return, will have a natural preference to get back in business for themselves. Nor are they the only ones who will want to become job givers rather than job holders. Several hundred thousand men who were employees before the war are filled with just this ambition. Quite recently Morton Frank, who until he joined the service was chairman of the postwar planning committee of the United States Junior Chamber of Commerce, made a spot check among a fairly large number of servicemen ranging from Army private to colonel, Navy apprentice seaman to commander, Marine private to major, and Coast Guard yeoman to lieutenant. Ensign Frank makes no claim that his survey was sufficiently comprehensive to guarantee the accuracy of his findings, but they are indicative at least. More than one-third of the men interviewed hope to go in business for themselves. Many of them may not make the grade, but the fact that they want to paddle their own canoes is vastly encouraging. Furthermore, the returning servicemen will not be the only ones who will want to go in business for themselves. In a recent poll of high-school students conducted by *Scholastic* magazine, 26.2 per cent of the boys questioned expressed a desire to own or manage their own businesses. Those of us on the home front are under obligation to see that these prospective job givers do not lack opportunity.

Now I should like to discuss briefly how the Committee for Economic Development hopes to make its contribution toward the achievement of an economy of high productivity. The committee is composed of a board of 26 trustees, 12 regional chairmen, approximately 100 district chairmen, and more than 1,400 community chairmen. The committee is completely independent and self-financed but has the active support of Jesse H. Jones, Secretary of Commerce, and Wayne C. Taylor, Under Secretary of Commerce, and it has been given the finest of co-operation by other governmental agencies as well as by great national organizations. Basic responsibility for the committee rests with its board of trustees. The committee's activities are carried out by two major divisions—the field development division and the research division.

The field development division has two functions: to gather from all possible sources helpful information on postwar planning, and to disseminate that information to as high a percentage of America's employers as possible. Much information of value to all businessmen has been accumulated already. More is being gathered. Experts in manufacturing, marketing, sales, finance, and management engineering are pooling their knowledge and making it available to expert writers who can tell the story in such a way that all businessmen can understand it. The fact that this information has been and is being assembled does not, of course, fulfill the second function of the field development division. To disseminate this

(Continued on page 364)

This is
**A WAR OF
 CHEMICALS,
 TOO**



In fact modern warfare would be impossible without them. And many vital chemical products and processes would be impossible . . . or prohibitively costly . . . without automatic controls. Numerous plants in this greatly expanded . . . and still expanding . . . industry use Masoneilan equipment, which may be the reason you have been unable to obtain the controls you wanted when you wanted them. For vital war winning industries come first. If you are one of our friends in this situation remember that the controller, control valve or other equipment you wanted probably helped make the gas masks of the boys in Africa, the powder in those tommy-gun cartridges that licked the Japs in



Guadalcanal, the tires on that supply truck in Australia, and the high octane gasoline that is flying American war-birds over Hitlerland.

MASON-NEILAN REGULATOR COMPANY

BOSTON,

MASS.



WINNING THE PEACE

(Continued from page 362)

information and to stimulate a high percentage of America's 2,000,000 employers to plan boldly and intelligently, some 1,400 community committees have been organized.

The individual businessman, in planning for expanded production, is faced with problems beyond his own control. These problems fall into two groups: those which will arise in the period of transition from a war to a peace economy, and those which will arise after reconversion has been completed. In the first group are such questions as that of securing prompt payment on termination of war contracts; of disposing of government-owned surpluses and government-owned plants; of suspension of wartime government controls; of employment for returning servicemen and for war workers released upon termination of government contracts. The second group includes problems relating to Federal taxation, foreign trade, and so on.

We businessmen of the Committee for Economic Development do not pretend to know the answers; but the committee has a research staff composed of leading economists and scholars who are studying these problems. This staff will, after careful study, supply the data on which realistic recommendations can be based. With the facts known, business, agriculture, and labor can approach government agencies with concrete proposals drawn up in the interest of the national economy as a whole — that means all of us — for legislation and policies which will liberate and stimulate business to provide its maximum share of jobs and production after the war.

The setup of the research division is unique in that while independence is guaranteed the scholars, they have the opportunity to consult with businessmen and other scholars as their studies progress. Because of the eminence of the scholars, it is our hope that their findings will have considerable influence on the future policies of various segments of our economy.

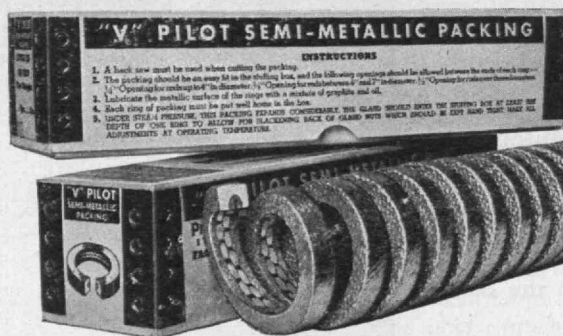
The research division suggests that many of the present policies of government, business, labor, and agriculture have sprung from fears that are inherent in an economy of scarcity. Monopolistic practices in that area of our economy where competition should prevail result from fears that there won't be enough customers for our goods. Labor's support of feather-bedding rules in opposition to incentive payment has its roots in a conception that jobs are not plentiful enough to go around. All restrictive measures in agriculture spring from the fear of production in excess of demand. Government policies are a mere reflection of all these fears. There must be an abrupt about-face by all of us if we are not to miss a genuine opportunity to achieve an economy of plenty.

It is the studied opinion of the Committee for Economic Development that an increase in productivity of from 30 to 45 per cent is attainable. All the tangible factors essential to the realization of the objective will be present when peace comes. At the end of the war, speaking generally, our supply of raw materials will be ample, and certain of them will be available in greatly increased volume over pre-war levels; our plant facilities will be far greater than were those of the pre-war period; we shall have a peak supply of skilled production workers

(Concluded on page 366)

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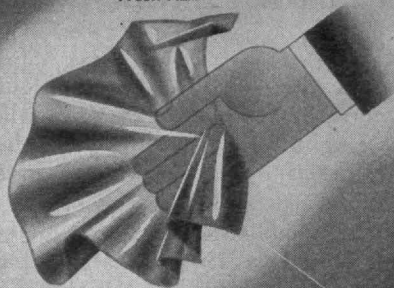
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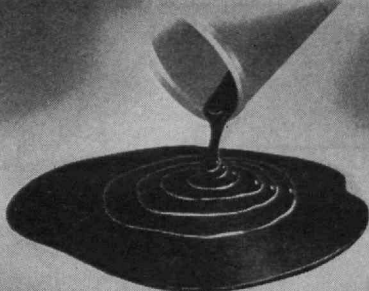
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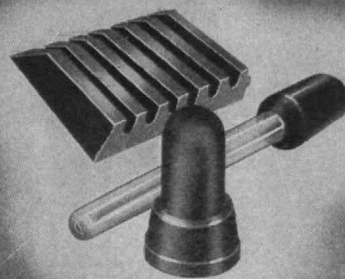
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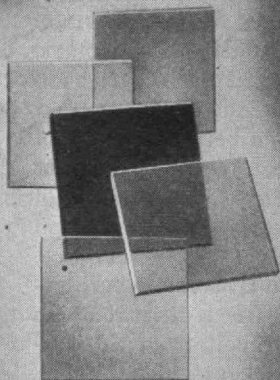
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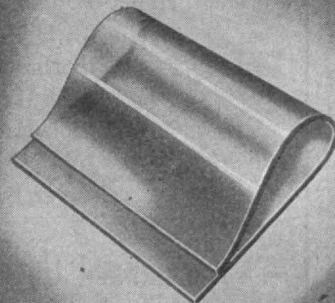
TYGON MOLDED GOODS



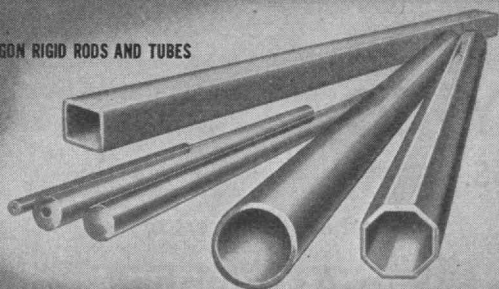
TYGON RIGID SHEETS



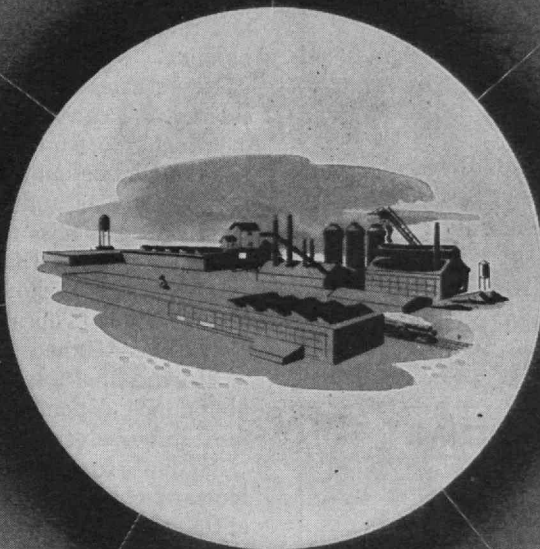
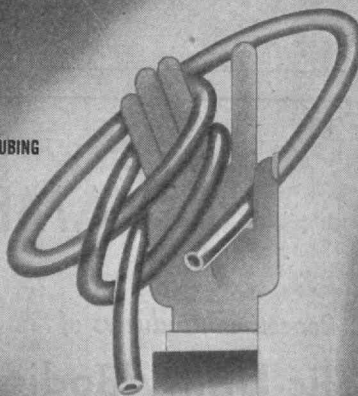
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they are odorless, tasteless, and relatively non-toxic, and may be compounded to be completely non-toxic where necessary.

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U. S. STONEWARE
AKRON, OHIO

WINNING THE PEACE

(Concluded from page 364)

and management workers; we shall have a tremendous pent-up demand for goods; the volume of savings will be at record-breaking heights. In 1943, for example, savings exceeded \$35,000,000,000 as against an average of \$5,000,000,000 during the 1930's. By the end of 1944, savings in the hands of individuals should exceed \$100,000,000,000. We shall face the necessity of rehabilitating and revitalizing our system of distribution, but this can be done.

Nevertheless, certain intangibles must also be considered. We can miss the chance for a dynamic economy in which more people will have more if government, business, labor, and agriculture fail to subordinate their group interests and to work together for the common good. We can miss that chance if, when A Day comes, we, the people of this country, and particularly the job givers, hesitate, show timidity, and choose to proceed with caution. This must not happen because time is of the essence. Unnecessary delay might lose the peace for us. In the final analysis, achievement of an economy of abundance depends on whether we have courage and faith in ourselves.

To quote from an editorial by John H. Sorrells, Scripps-Howard columnist: "What we need is a revival of an authentic spirit of revolution—a revolt from the tyranny of fear and reactionarism; a recapture of the will, as well as the means, to venture; a triumphant march to the far horizons of the soul; not a retreat to a Maginot of 'security.'"



Henry E. Warren, President, 1894
 Irving B. Dodge, Secretary, 1898
 Elisabeth Hemenway Hawks, 1922
 Fred M. Estes, 1918
 Ralph H. Sawyer, 1917
 John J. Jarosh, 1930
 Meyer P. White, 1931

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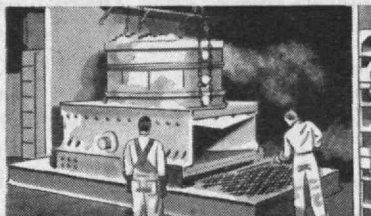
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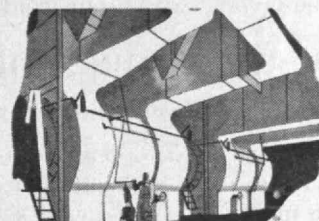
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"Post war planning" A year ago it was unpatriotic to mention the word. Today it is industry's greatest challenge. A challenge that AIR-AT-WORK can help you meet—every step of the way—from designing a better product to making it more efficiently and improving the conditions under which it is made. Sturtevant Engineers have the knack of putting a finger on the *right* spots for air handling equipment. We invite an opportunity to sit down and discuss these applications in terms of *your* operations and products—without obligation.



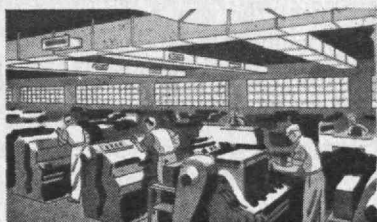
AIR to grab dust and keep it away from men and machines

Wherever dust will be created, Sturtevant has a special method of keeping it in line, safeguarding both employees and equipment, minimizing the cost of operation. For example, instead of carrying off and wasting heated room air, a new technique whirls it through dust separators, and returns the clean air to the room with all its valuable heat intact.



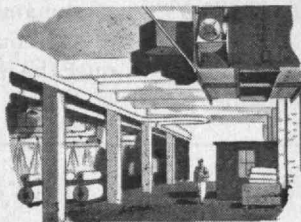
AIR to squeeze the last atom of energy out of your fuel

For tomorrow's power plant boilers, look to Sturtevant for the mechanical draft fans that will meet the demands for higher speeds, large volumes, highest pressures, temperatures and efficiencies. For example, new cyclone furnaces utilize Sturtevant centrifugal compressors to supply air for combustion at 70" pressure.



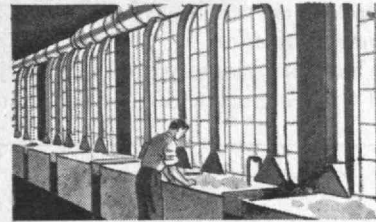
AIR to harness the weather to your production needs

For processes that must pay more attention to indoor weather, Sturtevant is ready with improved equipment and systems that permit matching the installation to the process involved. For example, air conditioning controlled within one degree of temperature and humidity makes possible assembly adjustment within tolerances of one millionth of an inch.



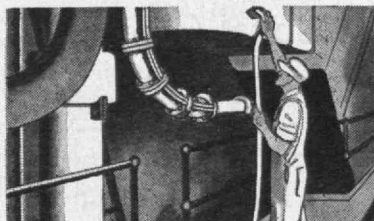
AIR to make every ounce of steam pay off in useful heat

In heating your plant tomorrow, count on Sturtevant for equipment and systems that put heat in the right places at the right temperature, cutting fuel bills in the bargain. Because Sturtevant manufactures all three types of unit heaters as well as central systems, we know what each can do best and which one or combination is best suited to your job.



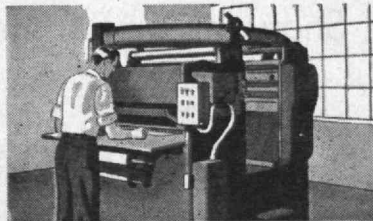
AIR to blast off fumes that keep you less than 100% efficient

If there's even a trace of fume or fog in your plant, look to Sturtevant for improved methods of holding it in check, adding years to the life-expectancy of men and machines. For example, acid fumes which formerly restricted production are now precision-controlled. Production line methods are possible without jeopardizing operators or equipment.



AIR to spruce up your plant with a minimum of cost and labor

In meeting new standards of plant cleanliness, Sturtevant is headquarters for Vacuum Cleaners that ferret out dirt faster, more efficiently. For example, improved methods of reaching into bins and machinery, up to pipes and ledges, offer new opportunities to minimize fire and explosion hazards and even to reclaim valuable dust.



AIR to help give your new products a jump on competition

Have you considered how air handling equipment, incorporated in your post-war product, can improve machine performance and product quality? For example, a blue print machine produces better prints faster with a specially designed and applied fan which exhausts heated air from the light chamber and uses it for drying prints more rapidly and uniformly.

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'08 H. R. Sewell	'22 J. E. Karcher
'14 G. C. Derry	'24 Philip Cohen
'15 H. F. Daley	'24 R. E. Reid
'15 O. L. Hall	'32 D. C. Hathaway
'17 L. B. Salt	'34 J. H. Spencer
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THE LABORATORY OF WAR

(Concluded from page 336)

most of them. You *will* make the most of them if you will keep two thoughts constantly before you: first, that whatever you have to accomplish must in large measure be founded on what others before you have done in paving the way, and, second, that however far you may go, greater advances will still lie ahead.

May I extend to you my heartiest congratulations on your past successes and my sincere wish that your future may be favored with a fair wind and Godspeed.

THE FORCE OF IDEALS

(Continued from page 334)

pass through in the opposite direction. By this means he could bring about a situation in which the average speed of the molecules on the west side of the partition, and therefore the temperature, is greater than on the east side. Work could then be done and power delivered. The little hypothetical fellow who thus could produce results contrary to the second law of thermodynamics has been dubbed "Maxwell's demon."

By suitable idealized construction, the little trap door can be theoretically moved back and forth without net expenditure of work. Hence the only prerequisite to thus rising above the restrictions of the second law of thermodynamics is *exercise of intelligence to carry out a skillfully planned operation.*

I have occasionally used this story of Maxwell's demon and the second law of thermodynamics as an analogy to

emphasize the importance in human affairs of intelligent planning and systematic effort according to that plan. The natural, undirected tendency of all human affairs is to run down. Just as other forms of energy tend to turn into the least available form — heat — so the driving power of a business concern, or of a country, or of a human being tends to deteriorate without intelligent direction.

Hence one might say that the second law of thermodynamics for human affairs is that their natural tendency is to go from bad to worse, and that the "Maxwell demon" which can reverse this trend is intelligent action.

One can carry the analogy farther. Just as the energy of heat is unavailable if all heat-containing bodies are at the same level of temperature, so in human affairs the power of accomplishment is largely lost if all people are at the same level — as, for example, if they have the same training, or the same wealth, or the same purpose in life, or the same political faith. There is danger in overstandardization even if the standards are high, for standardization means stagnation. Just as heat energy becomes available only when there are differences of temperature, so human affairs become dynamic and progressive only when there are differences of viewpoint.

Much as I believe in the significance of intelligent direction of human affairs and in the stimulating interaction of different points of view, I nevertheless believe that these are not the final answers. Even with a Maxwell's demon to help, our analogy from the second law of thermodynamics does not point the way to successful handling of our destinies. Alexander the Great set out to conquer the world. But even with his fiery ambition, brilliant

(Continued on page 370)

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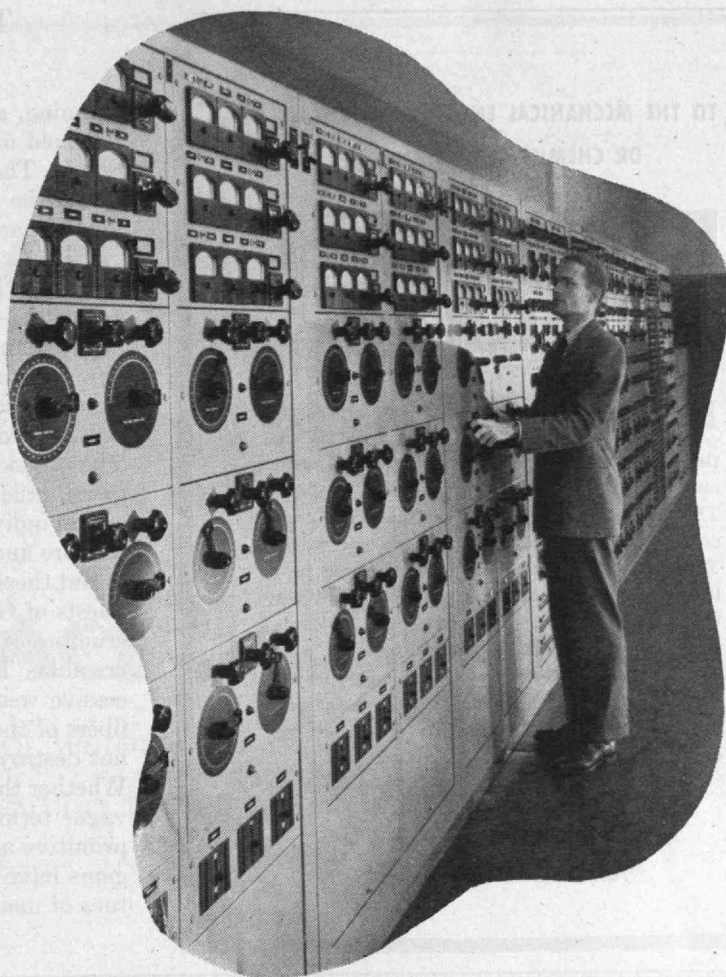
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BOX E
THE TECHNOLOGY REVIEW
M. I. T.
CAMBRIDGE 39, MASS.

THE FORCE OF IDEALS

(Continued from page 368)

planning, and sustained execution, his accomplishments survived only in their ruins. The same was true of Napoleon. The same appears to be the coming fate of Hitler. Much the same statement could be made about almost any human institution or organization.

What is it in human affairs that has stood the test of time, that is a living force which draws men ever upward against the forces that tend to weaken or destroy? Intelligence is not the sole answer, helpful as it is. I know not how to express it, but there seems to have been in man from the earliest times an instinctive urge toward goodness, friendliness, unselfishness, ambition to help others. These good instincts struggle against other instincts of greed, cruelty, jealousy. This struggle appears in nations and in individuals, in long epochs and in everyday life, in folklore and superstition and religion.

But these good instincts have survived the ruthless conquests of Genghis Khan, the ambitions of Napoleon, the cruelties of slavery, the ideologies of despots and reformers alike. They survive in spite of abject poverty or excessive wealth. They seem deeply enrooted in the very fibers of the human race, and they can be cultivated but not destroyed. This seems to be the evidence of history. Whether this thing which I am groping to describe by the vague term "good instincts" is in fact religion in a very primitive and basic form, I do not know. Certainly religions have been built around and have extolled the virtues of unselfishness and of ambition to serve others.

(Concluded on page 372)

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THE FORCE OF IDEALS

(Concluded from page 370)

With all this introduction about the second law of thermodynamics, and Napoleon's wars, and religion, I can now come to two very definite statements which are proved by experience and which are appropriate to this occasion:

(1) Trained intelligence is a wonderful tool. This tool has been sharpened by your educational experience. It can enable you to accomplish much. If properly used it can even enable you, like Maxwell's demon, to accomplish the otherwise impossible. Keep this tool bright and sharp by the grinding process of continued study and intellectual effort.

(2) Trained intelligence alone is not enough. A sharp tool can work ruin if used for destructive purposes. Ideals of altruism — of ambition to serve others who need help or to serve good causes — ideals of integrity and dependability are the forces which must guide the tools if the output is to be of any large permanent value. These ideals, which may sometimes seem vague or at times not very compelling, are nevertheless the most powerful forces in the world. They have outlasted mountains and civilizations. Day by day, and man by man, they make the difference between a mucker and a nobleman.

So much for my brief sermon. It is much more difficult to express adequately a farewell message. We know that practically all of you are destined for war service of one type or another, with great or little personal risk as fate and the nature of your service may decide. We expect to

see *many* of you again, at some class reunion or other function; we hope to see *all* of you again; we realize that some may not come back and we hope that these may be very few. We know that you will give a good account of yourselves — your record during your years here shows that you have it in you.

You know that we are back of you; that many of us, Alumni and Faculty alike, are with you; and that some are ahead of you. This unpleasant but necessary job of winning the war is one we are all in together, each in that place where fitness or luck has put us. The fact is that this war effort is a great crusade of our nation and our allies — forced upon us, to be sure, but now to be carried through with all the vigor and dispatch that we can muster. You are not alone; you are shoulder to shoulder in a nation mobilized to do a job.

So let us not emphasize your farewell from Technology, but rather let us feel that all Technology men, young and old — and you the youngest — are bound together with unusually strong ties which strengthen us one and all in the job ahead, whether it be in the war or afterwards in the peace. In either war or peace we have our place, an important and useful place. We shall find continued satisfaction and renewed strength as we keep alive our ties with the Institute and with each other — classmates, Faculty, Alumni, Corporation.

Let me not say "farewell" to you, but let each one of us, in his heart, wish his fellows the best of luck. And let us separate with confidence and determination that each and all will do a job of which we shall all be proud. In this spirit, I bid you Godspeed.

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The sum total of coffee knowledge is this. You judge good coffee by its fragrance. It should be rich and mellow tasting too . . . so enjoyable you pass your cup for more. How do you get such coffee? Just remember the name Beech-Nut.

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THE ARCHANGELS' GIFTS

(Continued from page 332)

in the making today. I am not here to advocate any particular system. I have no panacea to offer. Military force, however, is clearly implied in the problem, since all agreements and all persuasions have failed so dismally in the past. Let us therefore look at the military side of it.

Collective security, I assume, can be built on one of two general principles. The first is the suppression of war by international action taken after the overt act. In practice if not in theory, that was the principle on which the covenant of the League of Nations was based. Certain sanctions, or repressive measures, were to be taken against the nation breaking the peace of the world but only after the council of the league had agreed that the peace had been broken and that sanctions must be applied. The second principle is the application of sanctions long before the overt act, for the purpose of preventing the accumulation of military power and reserves with which a nation could break the peace.

I recognize fully the political difficulties involved. We did not accept the first principle 20 years ago. The second principle would exact an even greater political commitment. We should have to agree to act for the preservation of the world's peace long before either that peace or we ourselves were directly threatened. Within our own country and those with which we collaborate, there would have to be established and maintained political will and integrity of the first order. Without singleness of purpose and timely action, the principle would fail. But these matters lie beyond my province. I can consider only the military side of the question.

As far as wars of conquest are concerned — those great disruptive conflicts which necessarily involve this closely interlocked world — a vast military difference exists between the two principles of collective security. The difference lies in whether a people who may be bent on conquest are permitted to accumulate, unhampered, the military power they require for conquest. Modern war is so insatiable that conquest on any considerable scale is out of the question unless it be predicated on such an accumulation. The great reserves in men and material, by means of which alone a nation has any prospect of sustained military operations, must be built up through years of labor. Those essential reserves are so vast that only a part of them can be accumulated in secret. That is why we knew pretty well what the Axis powers were doing in the fatal decade before this war. The reserves are therefore both the *sine qua non* of successful conquest and its clear danger sign. They are in truth the Achilles' heel of militarism. Prevent their accumulation and you nullify Lucifer's wars, for you make conquest impossible.

You men of science should be able to judge, none better, how basic are material reserves, raw products and finished, to the success of modern war. No one could better estimate the bill of materials required to meet a given set of military projects. Conversely, it is to the scientists that we should look when we reach that point of intelligence at which we set ourselves to prevent the accumulation of military power in the hands of potential conquerors. You could tell us what we must prevent, and when. Either way we play the game, we should look to

(Continued on page 380)

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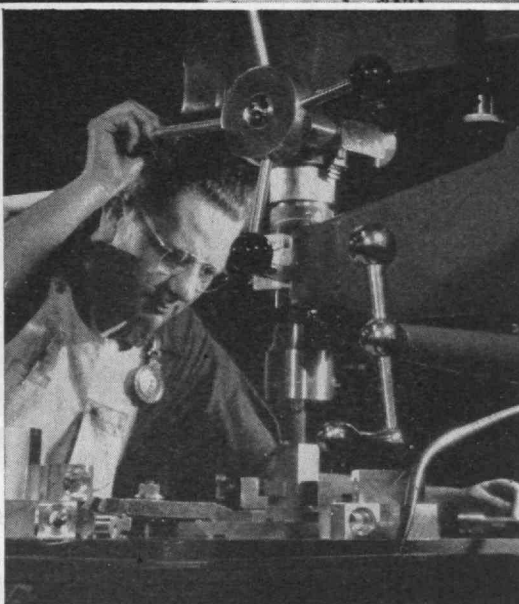
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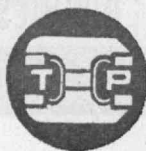
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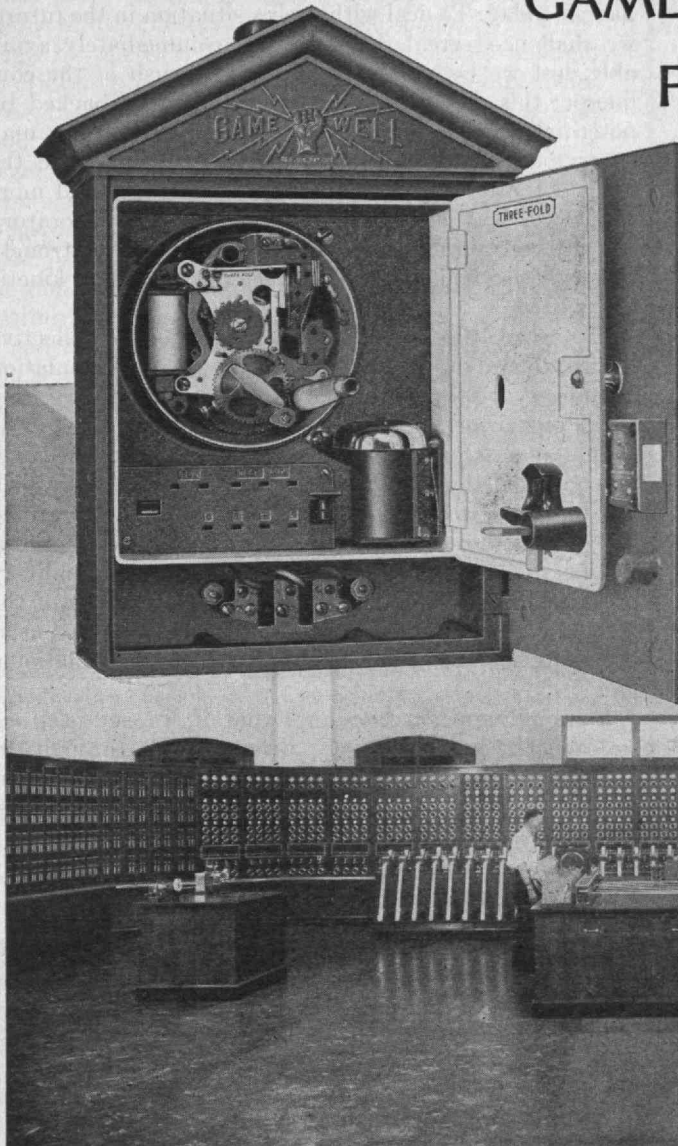
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THE GAMEWELL COMPANY
Newton Upper Falls, Massachusetts

THE ARCHANGELS' GIFTS

(Continued from page 374)

you. If we must be prepared to face would-be conquerors at their own chosen time, as we are doing today, you could tell us what we need—and may your aid be accepted less tardily another time. If we reach the pitch of resolution that says “No” to those who are accumulating the wherewithal of war, you could best judge when that word must be said and could put in our hands the means of enforcing it.

To return to the crux of the military question: Do we prevent war by action taken on our initiative, or do we suppress war begun on the other fellow's initiative? The military and the material advantage of the initiative can hardly be overestimated. Let the would-be conqueror accumulate, openly for the most part, the reserves he needs, give him his choice of time and place, let him spring the psychological surprise of war, which is always effective on complacent people, and the restoration of peace is indeed a gigantic task. That fact we see clearly today.

I suggest that Washington's “respectable defensive posture” will, in the future, depend largely on which of the two broad principles of collective security is adopted. We and our associates in collective security will need quite different forces, both in kind and in measure, in the two situations. For if our collective security is based on employment of sanctions only after the overt act, we must be prepared to deal with a recalcitrant people who have acted on their initiative after they have accumulated power behind them. What are euphemistically

called “sanctions” would then be full-scale war, as we have it today. To deal with such a situation in the future, we shall need great defensive force immediately available, lest we be overcome in the first rush of the conqueror; this defensive force will have to be backed by potentially great offensive force in order that we may overcome his initiative and finally crush him. And the more potential our offensive force, the longer and more costly will be the resultant war. Both in the laboratory and in the training camp, we are realizing very strongly today the lag which exists between potential and kinetic force.

If, on the other hand, we adopt a system of collective security based on the prevention of a great accumulation of military power in the hands of any people, we may build our armed forces on quite different lines. The people against whom our sanctions will be applied will not be given the initiative of time and place. They will not be ready to put the issue to the sword. Our armed forces, and those of our associates in collective security, will be able to threaten immediately or to exert military pressure promptly on the transportation systems of the people with whom we are dealing. Transportation is becoming more and more the nerve ganglia of national life.

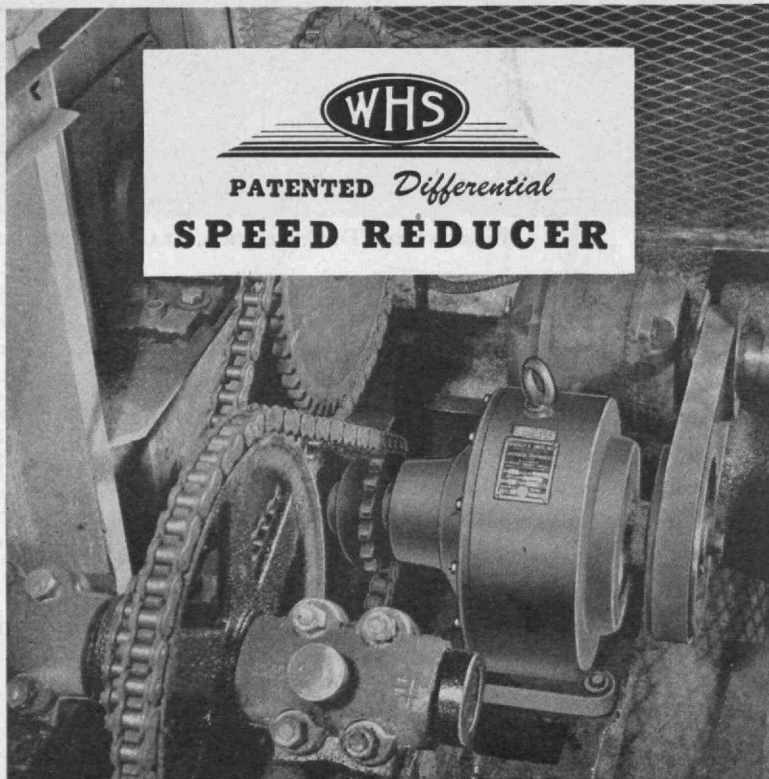
It would appear, therefore, that if we act in time, we can gain our end largely, if not wholly, through the use of air and sea power based on strategic points about the world. We shall need ground forces only sufficient to cover those bases and our industrial resources. Military sanctions so imposed should bring to book any potentially recalcitrant people.

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What I am saying, in sum, is simply that the great decisions on the preservation of peace should be thought through to the end. I am well aware of the political difficulties involved. But however great those difficulties may be, the military solution of the problem must depend on political commitments. Those commitments state the problem, and until a problem is stated the solution of it is nebulous. We have been all too prone throughout our past history to make political commitments, avowed or implied, and then to regard our military and naval establishments as something wholly apart from the necessities of those commitments, or to ignore the military and naval establishments entirely. That we did in the days when our security rested on us alone, when the equating of our military requirements with our political commitments was a relatively simple process. How much more necessary is it that that equation should balance when we enter into the far more complicated system of collective security.

You men to whom the great advantages of this Institute have been given, you whose influence in your country's welfare will not be negligible in the years after this war, may well learn something of the broader problems of peace through your war experience. The cohesion, the oneness, the sacrifices of war must be of some lasting worth. That, also, was what Michael meant.

Meanwhile, first and foremost, this war is to be won. For that task, I welcome you into the fellowship of soldiers. From this war, bring back your shields and with them a zeal to serve your country in peace as you have served her in war. Bring back a broad understanding of armed forces — not only your own unit but armed forces as a whole — what they should be and how they should be used in a world grown young and green again.

THE INSTITUTE GAZETTE

(Continued from page 346) •

in industry and government who are devoting their efforts to victory.

Beyond these personal sacrifices is a more intangible but nevertheless very real sacrifice which the Institute itself is making and which can in no sense be safeguarded through any "no financial profit, no loss" formula that is involved in teaching and research contracts. I refer to the fact that the Institute is deprived of the thought and the services of its staff which could very well be devoted to constructive moves for improving the financial and the educational condition of the Institute for the postwar period. Among us all there are many constructive ideas for improving our educational procedures and strengthening our staff. We have many ideas for improving the welfare and *esprit de corps* of our student body. We have many fine research projects which are laid on the shelf. We know that there exist at the present time some rather unique sources of funds for financing at least some of these ideas or projects. Unfortunately no one at the Institute has any time to devote to these matters, and if I have one source of worry which sometimes keeps me awake at night it is the thought of these opportunities which are being lost through lack of attention. But this is one of the sacrifices which we are all making because each of us is convinced that, important as all these things are, they will be of no avail unless we win the war, and the war is yet far from having been won. We also recognize the fact that, important as these ideas and projects may be, they may be insignificant in comparison to the cost in human life and economy if the war is extended one

(Continued on page 382)

INFRARED SPECTROSCOPY

Industrial Applications

By R. Bowling Barnes, Robert C. Gore, Urner Liddel, and V. Z. Williams

Stamford Research Laboratories, American Cyanamid Company, Stamford, Conn.

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NOTE: The data on Infrared Spectroscopy compiled by Dr. Barnes and his associates and published in the November issue of the *Analytical Edition of Industrial and Engineering Chemistry* together with new material added, including a very valuable bibliography, is now published in a bound volume and offered at price of \$2.25 per copy.

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THE INSTITUTE GAZETTE

(Continued from page 381)

week or one month beyond the date at which it might be brought to a successful termination by our efforts and those of all other good and true Americans.

The type of sacrifice which I here mention is not unique with us. I know that it is in the minds of the administrative officers of many other institutions, both of an educational and of a business type. It is one of the unfortunate aspects of war. And yet I feel that outside of the loss of human life and the human misery which attends war, this type of sacrifice may rank a close second to the financial loss which we all experience through the economic cost of war and the resulting taxation and dislocation of ordinary economic processes.

The thought of these sacrifices should gird us all to renewed effort to bring the war to the quickest possible successful conclusion. Then, happily, we can all go about our business in peace and pursue the constructive enterprises which we know can heal the ravages of war and bring back to the nation the prosperity and the real happiness which goes with peace, opportunity, and accomplishment.

Graduation

THE effects of the war on the Institute's student body were sharply apparent at the 77th graduation exercises in Symphony Hall, for in contrast to a normal class of at least 600, a total of only 281 degrees and four certificates in public health were awarded to 285 graduates. This year's class included ten doctors of philosophy, six doctors of science, one doctor of public health, three masters in city planning, three masters in public health, one master in architecture, 45 masters of science (of whom four also received the degree of bachelor of science), six bachelors in architecture, and 206 bachelors of science.

During the exercises President Compton introduced the various groups in the armed forces among the graduates. With Captain Charles S. Joyce, senior naval officer at the Institute, and Lieutenant Colonel Joseph F. Cook, Jr., '22, Head of the Department of Military Science and Tactics, on either side of him, Dr. Compton called upon each group to rise as he named it, and the men, standing at attention, saluted their officers.

Among those who received degrees were 11 women. Mrs. Joy R. Dulaney of Lynchburg, Va., and Mary E. Leonard of Boston were awarded degrees of master in public health. Degrees of bachelor in architecture were awarded to Katharine B. Adams of Cambridge and Rosemary J. Burghoff of Bristol, Conn. The degree of bachelor of science in aeronautical engineering was awarded to Mrs. Peggy B. Smith of Guilford, Conn. Those who received certificates in public health were Donna de Rochemont of Rockland, Maine; Lillian A. Kasparian and Ruth C. White of Boston; and Charlotte M. MacKelvie of Pittsfield. Anne L. Lyons of Swampscott received the degree of bachelor of science in chemistry, and Egilda deAmicis of Fall River, the degree of bachelor of science in biology.

Members of the 50-year Class of 1894 were given a place of honor in the academic procession. Those who attended were Walter V. Batson, John W. Chapman, Alan A. Claffin, Nathan B. Day, Mrs. Darragh de Lancey, Harry W. Gardner, Harry P. Hastings, George B. Haven,

(Concluded on page 384)

We owe it to our fighters to back them with every force at our command and to prepare an economically victorious nation for their return. In both these obligations industrial research spearheads the battle.

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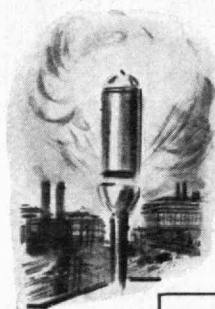
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THE INSTITUTE GAZETTE

(Concluded from page 382)

William H. King, Henry O. Lacount, Frank W. Lovejoy, William D. McJennett, William H. Pratt, Samuel C. Prescott, and Henry E. Warren.

The 25-year Class of 1919 was represented in the procession by Donald D. Way, its President, and Eugene R. Smoley, the Class Secretary.

Rogers Awards

WILLIAM BARTON ROGERS awards of \$300, which are given annually in memory of the founder and first President of the Institute in recognition of high scholarship, character, and leadership in student affairs, were presented to five Technology seniors just before their graduations on February 28. The recipients were Lamar Field, Anniston, Ala.; Langdon S. Flowers, Thomasville, Ga.; Wilson N. Gilliat, Kansas City, Mo.; Malcolm G. Kispert, Fall River, Mass.; and Caleb S. Taft, New Haven, Conn.

Presentation of the awards was made by President Compton in a special ceremony attended by the Faculty Committee on Undergraduate Scholarships, of which Dean H. E. Lobdell, '17, is chairman, and the Heads of the academic Departments in which the students are studying.

Field, a graduate of Anniston High School, was a student in the Institute's Department of Chemistry and a member of the Institute Committee, Gridiron, and the Chemical Society. He was likewise general manager of *The Tech*, and his sports activities included the rifle and fencing teams.

Flowers, a member of the Navy V-12 unit, prepared for the Institute at Thomasville High School. A student in Aeronautical Engineering, he is vice-president of his Class. He was vice-president of the Institute of the Aeronautical Sciences and a member of the Beaver Club, the Beaver Key Society, the Quadrangle Club, and the Tech Boat Club. He was also a member of the editorial board of *The Tech* and captain of the crew.

Gilliat is studying civil engineering and is chairman of the Walker Memorial Committee. He prepared for the Institute at the Westport High School. He is a member of the executive committee of the Institute Committee and a member of the Beaver Key Society, the American Society of Civil Engineers, the Combined Musical Clubs, and the Glee Club. He is also on the crew.

Kispert entered the Institute from B.M.C. Durfee High School. A student in Aeronautical Engineering, he was a member of the Dormitory Committee, the Senior House Committee, the Student-Faculty Committee, the Beaver Club, the Combined Musical Clubs, and the Glee Club.

Taft, who was president of the M.I.T. Athletic Association, prepared for Technology at New Haven High School. He was a student in the Department of Mechanical Engineering and was vice-president of his Class in his junior year. He was a member of the Beaver Club, the Beaver Key Society, the Quadrangle Club, and the Tech Boat Club, and was captain of the basketball team and a member of the crew.

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THE TREND OF AFFAIRS

(Continued from page 326)

engineers had produced moderately effective and dependable machines, a preliminary type of medical examination for pilots had come into use. In the early tests, the senses of sight and hearing were particularly considered, as well as the supposed indicators of physical fitness which concerned the heart, lungs, and muscular system.

Yet it soon became obvious that not all those judged physically fit by these standards could become successful fliers. From a fifth to a half of the men in each training group did not pass in the primary flight training, and many others failed in their advanced work. Nervous breakdowns, extra susceptibility to flying accidents, and slowness to learn without additional instruction were encountered.

The desired triple miracle of abolishing "washouts," eliminating the accident tendency, and curing the symptoms or other consequences of flying stress was not attained by the application, beginning in 1916, of psychological tests and techniques. Nor has it yet been attained, though psychological analysis of the complex problem still offers promise of aid in reducing attrition in training and in later operational flying. At first, psychological examination of fliers was little removed from the physical examination tests. Speed and accuracy in reaction, plus emotional stability, seemed the psychological functions most obviously involved in the success of a pilot; tests for these were adapted and added to the physical fitness tests but with disappointing results. As investigators came to better understanding of the fliers' job, more and more complex psychomotor tests were developed as standards in preselection. Well-developed powers of attention, memory, and judgment, favorable traits of temperament and personality, sustaining motivation and goal-directed interest came to be recognized as important in the judgment of possible aviators. Weighted indexes of individual psychological competence, if not always of flying fitness, became available as the results of a number of measurements were combined. Though the problem of a criterion of flying success with which to correlate test results remained difficult, the general progress made was in the right direction and the information secured had enough obvious helpfulness to be generally favored as a useful addition when candidates were being selected for training.

As the practical problem of selection of fliers diminished in the years of peace between the two great wars, aviation psychology suffered almost a complete eclipse. During the same interval, however, great advancement was made in industrial psychology, which was destined to contribute in numerous ways to the present rapid development of aviation psychology. The techniques of job analysis now available in every important field are useful; test building has become soundly scientific; methods of improving test reliability are well understood; the setting up of composite criteria based on objective standards is now regarded as an essential prerequisite to measurement. The influences of regular, known variables and the results of tricky infiltration of chance elements can both now usually be largely eliminated from standard tests.

(Continued on page 388)

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THE TREND OF AFFAIRS

(Continued from page 386)

The foresight of the Civil Aeronautics Administration in setting up a Civilian Pilot Training program in 1939 and in providing for psychological research in pilot selection and training Dr. Miles declared to have been justified by later developments. Since research and training had kept in step, aviation psychology was ready to crawl into the cockpit along with the student and his instructor when the United States' participation in World War II required. By the late pre-Pearl Harbor period, the behavior of the student flier could be directly studied during flight by means of supplementary instrument panels, motion-picture cameras, flight recorders, voice-recording equipment, and many specially designed lightweight measuring instruments. Cockpit and laboratory investigations have progressed simultaneously, and military psychologists have worked together with civilians in the organized planning and conduct of preliminary testing programs for the development and standardization of test instruments and procedures.

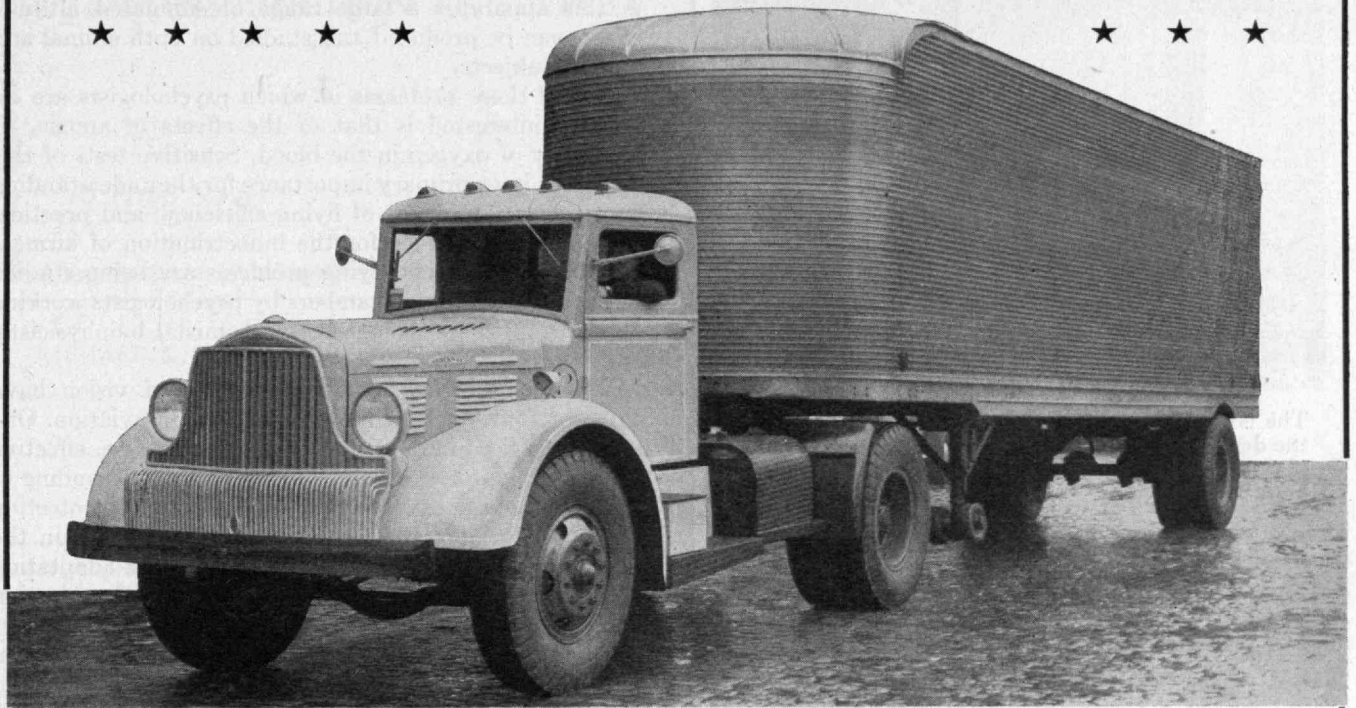
The immediate factors that favor progress and ultimate success in the primary flight training courses have been extensively studied. Criteria of adequacy are correlated with the various types of psychological material. The latter includes biographical data, sensory and perceptual tests which to some extent simulate the cockpit situation, intelligence and mental alertness examinations, tests of special aptitude (usually mechanical aptitude), interest and attitude profiles, and measurements of emotional stability under stress. The current conclusions from these efforts, first channelized in the United States through the National Research Council's committee on selection and training of aircraft pilots, set up to aid the Civil Aeronautics Administration, are regularly available to the Army and Navy. Large numbers of psychologists within the services have rapidly advanced the program of preselection of air force personnel. The air surgeon's aviation psychology program, based on thorough psychological examinations, takes account of the candidate's preference for pilot, bombardier, or navigator training, of his psychological aptitude for different types of training as shown by the tests, and of previous training and flying experience that he may have had. Detailed results cannot be made public at present, but it is well known that the net results are favorable; man power and instruction hours are saved as well as material supplies, men are placed where they can be effective, and, most important of all, lives are saved for further useful service.

Preselection was logically the first problem in aviation psychology and, in terms of numbers of men involved, also the largest. But it is only one of many psychological problems in either military or civil aviation. Significant contributions will undoubtedly be made in the combined development of student flight training and instructor training. Learning is a psychological process; flight training is directed learning.

The adjustment of the human organism to flight, especially at high altitudes, raises many psychophysiological problems. The standard equipment for basic studies in these constantly overlapping areas of physiolo-

(Continued on page 390)

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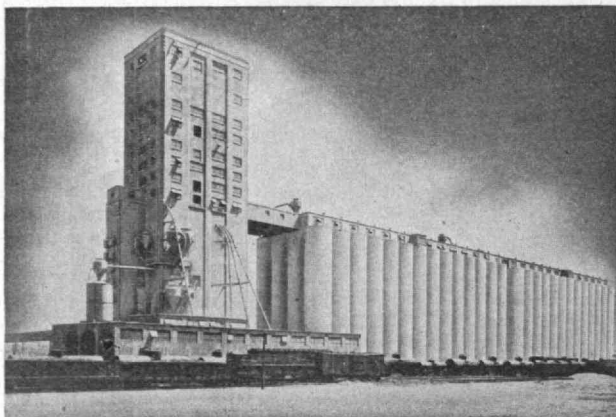
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THE TREND OF AFFAIRS

(Continued from page 388)

ogy and psychology is the decompression chamber. Within this apparatus a large range of simulated altitude effects can be produced and studied on both animal and human subjects.

One of these problems in which psychologists are especially interested is that of the effects of anoxia, or deficiency of oxygen in the blood. Sensitive tests of this condition have primary importance for the understanding and prevention of loss of flying efficiency, and practical secondary importance for the indoctrination of airmen. Numerous important flying problems are being studied in the decompression chambers by psychologists working in teams with physiologists, biochemists, biophysicists, and others.

Various problems in the psychology of vision have emerged from operational requirements in aviation. One of these is the function of vision — in this case, effective peripheral vision — involved in the successful landing of planes. Another example problem is that of protecting dark adaptation from the effects of lighting within the plane during night flying. The study of dark adaptation has led to the introduction of new features in the selection and classification of personnel, and has also brought about the development of special equipment and the elaboration of training methods. Development of special devices to facilitate many phases of night flying and for daytime visual reconnaissance has been a primary interest of aviation psychology.

Mits's Education

THIS bright little book * with its bright little drawings in a style reminiscent of the late Hendrik Willem Van Loon and its half pages of irregular lines in a style reminiscent of archie the cockroach, represents another attempt to sugar-coat the pill of mathematical learning. Like those chocolate-covered iron pills which I remember from my distant youth, the flavor of the confectionery is slightly impaired by the faint aroma of the doctor's office. There is no doubt that the mathematical contents are highly medicinal and of considerable interest — to the practitioner. The lay consumer may find a certain compensation for the minerals and vitamins which he is forced to ingest by the thought that they must be good for him in some unknown way. At any rate, he is left with the feeling that he is now a participant in Modern Science, at least in the role of guinea pig.

The mathematical content of this book is varied and correct, and is presented in a whimsical style. Whimsey has a place in mathematics, as the writings of Lewis Carroll and P. E. B. Jourdain certainly show. However, intellectual whimsy is a commodity of a very delicate flavor and should not be used as a placebo to induce an unwilling patient to take what is good for him. Mathematical whimsy is killed when it is used as a vehicle to convey a large amount of irrelevant erudition.

(Continued on page 392)

* Hugh Gray Lieber and Lillian R. Lieber, *The Education of T. C. Mits; What Modern Mathematics Means to You* (New York: W. W. Norton and Company, Inc., 1944). 230 pages, \$2.50.

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THE TREND OF AFFAIRS

(Continued from page 390)

I am most distrustful of attempts to popularize science, unless they have about them something of the solidity and sincerity of Hogben's work. Anything that leads the reader to believe that he can acquire the benefits of a mathematical education without a proportional amount of pencil and paper and hard thinking is simply a mislabeling of the package. — NORBERT WIENER.

Spicilegium

CHEMISTRY and mechanical manipulation accounted for 65 per cent of the increased production of 100-octane aviation gasoline by the United Nations in the two years following Pearl Harbor. The situation did not permit waiting for new plants to be built, Petroleum Administrator Harold L. Ickes said recently in commenting on the record of the petroleum industry; in two years we were able to boost our supply considerably more than 100 per cent without counting the output from new facilities. A breakdown of the increase shows that use of cumene as a blending agent accounted for 22.8 per cent of it; mechanical improvements and miscellaneous, 14 per cent; conversion of catalytic cracking units to aviation fuel production, 13.8 per cent; use of codimer as a blending agent, 9.1 per cent; addition of .6 cubic centimeter of tetraethyl lead per gallon, 3.5 per cent; use of toluene and other blending agents, 1.3 per cent. The total of these

(Concluded on page 394)



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THE TREND OF AFFAIRS

(Concluded from page 392)

increments attributed to "refinery ingenuity" is 64.5 per cent of the gain, the remainder coming from increased production from new facilities. ¶ Wood floors which can be cut from rolls, bathtubs of molded plywood, bakers' yeast, antifreeze solutions, and fireproofed wooden structures 17 stories in height are among the products which may be expected from wood once war is over, according to recent surveys of prospects for the industry. ¶ To divert aluminum for war uses, more than a million and a half square feet of glass were manufactured in 1943 for utilization in radio and phonograph records. More than 1,000,000 pounds of aluminum were thus made available for military applications. ¶ The insulating value of color is a subject of current interest in the news. Both for controlling temperature and for minimizing the evaporation of certain liquids, choice of the proper color is found effective. White, according to present information, has the highest power of repelling heat, and black the poorest. In the tropics, temperature in the hold of a white ship will be at least 10 degrees lower than in the hold of a vessel painted black. The United States Bureau of Mines, studying gasoline storage tanks, reports an evaporation loss of 3.54 per cent from red-painted tanks in four and a half months as against a loss of 1.4 per cent from tanks painted white. Householders find food for thought in data indicating that home heating radiators painted in white or light colors are some 17 per cent more efficient than those painted in black or bronze. ¶ Fish farming, the manipulation of food-producing skill concerning which this section animadverted in November, 1942, is helping in a remote way to meet the United States shortage of natural rubber. Three years ago, the government of Peru set aside the Pacaya River as a preserve for the cultivation of the pirarucu, or paicha, stocks of which then were rapidly being depleted. The paicha is the largest fish found in Amazon waters, and one of the largest freshwater fishes in the world, specimens having been recorded up to some 400 pounds in weight. The protein content of its dried flesh is reported as high as 36 per cent, as compared with 26 per cent in imported dried codfish. More than 10 long tons of the dried fish already have been delivered from the fish farm to markets of Iquitos, the city 2,200 miles up the Amazon from the Atlantic which is one of the centers of Amazon rubber development. Shortage of food supplies is one of the principal hindrances to extension of rubber production in the region, as additional workers move in for the tapping of wild rubber trees. The pirarucu whose dried flesh is in some measure filling the gap has reddish scales and a curious bony tongue thickly covered with rasplike teeth.

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TECHNOLOGY MEN IN ACTION

The Alumni Fund—Its Problems and Growth

M.I.T. Men at War

Alumni and Officers in the News

News from the Clubs and Classes

APRIL, 1944

TECHNOLOGY MEN IN ACTION

THE ALUMNI FUND — ITS PROBLEMS AND GROWTH

ONE of the most heartening experiences of the last four years has been the manner in which you of the Alumni have established the Alumni Fund program on an ever growing basis in spite of the world conditions which made the inauguration of such an enterprise particularly difficult. For the current year 1943-1944 we have approximately 8,850 contributors and have received almost \$116,000. . . . Starting only very recently in this activity, our Alumni Fund now stands sixth among all the college or university funds in the country, both in number of contributors and in amount contributed. Those who are responsible have our appreciation and thanks for the way in which they have developed this program. . . .

I wish to urge upon all Alumni that there is no way in which . . . they can make a finer contribution to the prosperity of the country in a most fundamental manner, than by their contributions to this Fund which will enable the Institute to go still farther in the direction of maintaining the highest quality of education . . . and advancing knowledge in the technological fields for which there will be so enormous an opportunity, especially in the years to come as we recover from the ravages of this war and make an effort to achieve a sustained and ever increasing prosperity and satisfaction for the people of this country.

PRESIDENT KARL TAYLOR COMPTON

— *in an address to the Alumni at the
Alumni Dinner, February 26, 1944*

TECHNOLOGY MEN IN ACTION

M.I.T. MEN AT WAR

Up to March 10 over 5,500 Institute Alumni, including 20 Admirals, one Commodore, and 68 Generals, were recorded as being in the active services of the United Nations. To date 54 Alumni have received military decorations.

Beginning with the November 1942 issue, The Review has included a listing of "M.I.T. Men at War." Corrections and additions to this list will be published in future issues. As a matter of convenience, promotions and corrections in the rank previously given are included under a single heading "Changes in Rank." The Review Editors are greatly indebted to the many Alumni and other readers who are continuing to co-operate so helpfully in reporting inevitable errors of omission and commission which they note in these listings.

Alumni are urged to write to their friends in the services. Letters addressed care of the Alumni Association, M.I.T., will be forwarded.

NEW DECORATIONS

- 1921 Barrows, Ralph G., Col., U.S.A.,
Legion of Merit—District
Engineer, Detroit District,
Great Lakes Division.
- 1935 Powers, William F., Lt. Col.,
U.S.A., Legion of Merit—
"For outstanding service in
the North African Campaign."
- 1938 Cagwin, Leland G., Maj., U.S.A.,
Legion of Merit—As Com-
mander of task force of 50 en-
listed volunteers departing
from Honolulu early in 1943
... creating the initial com-
bat garrison on small island in
South Pacific."
- **Flanagan, Robert, Lt., U.S.A.,
Purple Heart—Commando
Raid on Dieppe.

U.S.N.

- 1933 Wrigley, George, Jr., Lt. (j.g.)
1934 Franklin, B. Russell, Lt. (j.g.)
1935 Priggen, George H., Jr., Lt. (j.g.)
Alschuler, Alfred S., Jr., Lt. (j.g.)
1938 Spering, Ewing J., C.M.M.
Lacock, Daniel P., Lt. (j.g.)
Shuler, William T., Ens.
†White, William T., Y.
1940 Klock, John C., Ens.
1943 Briber, Frank E., Jr., Ens.
McWilliams, Frederick F., A.S.

U.S.M.C.

- 1931 Butler, Smedley D., Jr., 1st Lt.
1933 Robinson, Richard, Pvt.

CHANGES IN RANK

U.S.A.

- 1909 Scharff, Maurice R., Lt. Col. to
Col.
1917 ★Robinson, Clark, Capt. to Maj.
1919 Irwin, George A., Maj. to Lt. Col.
1924 Doolittle, James H., Maj. Gen.
to Lt. Gen.
Walker, Hugh L., Capt. to Maj.
1926 Bittner, Guy C., Maj. to Lt. Col.
Colt, Lebaron C., Capt. to Maj.
1927 Stephenson, Isaac W., Maj. to
Lt. Col.
1929 Wolbarsht, Archie, 2nd Lt. to
1st Lt.
1930 Heifetz, Arthur, Capt. to Maj.
Locklin, William H., 1st Lt. to
Capt.
1931 Lowm, Gilbert A., Capt. to Maj.
Luke, Charles D., 1st Lt. to Capt.
1932 Northam, Charles E., Capt. to
Maj.

† Missing in Action.

‡ Prisoner of War.

- 1933 Quick, Charles E., Lt. to Lt. Col.
Summer, I. Harry, Corp. to Sgt.
1934 Mitchell, Daniel C., Capt. to
Maj.
Seligman, Joseph L., Jr., Capt. to
Maj.
1935 Weems, William R., Capt. to
Maj.
1936 Gates, Clayton S., Maj. to Lt.
Col.
Thomas, Gordon C., Capt., to
Maj.
1937 Kendzur, Max S., A. C. to Lt.
Laus, Andre N., Pvt. to 1st Lt.
McHugh, William P., Lt. to Maj.
1942 Moore, Leo B., Capt. to Maj.
Cagwin, Leland G., Cadet to Maj.
Cilley, Wesley A., Cadet to 1st Lt.
Mehren, Bernard W., A. C. to
2nd Lt.
1939 Hobson, Charles F., Jr., Lt. to
Capt.
Pope, Gordon A., Capt. to Maj.
Shunk, Peter W., Lt. Col. to Col.
1940 Carnrick, George W., Jr., Lt to
Capt.
1941 Branham, Hugh M., A. C. to Lt.
1942 Inmsande, Robert R., 1st Lt. to
Capt.
Landes, Herbert D., Jr., 1st Lt.
to Capt.
Littwitz, James K., 1st Lt. to
Capt.
Towle, Philip H., Lt. to Capt.
1943 Heller, Steven, 2nd Lt. to 1st Lt.
Robinson, Gwynn H., 1st Lt. to
Capt.

U.S.N.

- 1920 Freeman, William M. B., Lt.
Comdr. to Comdr.
1927 Manseau, Bernard E., Lt. Comdr.
to Capt.

- 1929 Kraft, Wendell E., Lt. Comdr. to
Capt.
1934 Ellison, John H., Lt. Comdr. to
Comdr.
1940 Allen, Malcolm C., Ens. to Lt.
(j.g.)
1941 Frakes, Dale R., Lt. to Comdr.
Sipsey, Everett T., Ens. to Lt.
(j.g.)
1942 Jones, J. Halsey, Ens. to Lt. (j.g.)
Moore, Garrett T., Ens. to Lt.
(j.g.)
Sadler, Monroe S., Ens. to Lt.
(j.g.)

U.S.C.G.

- 1940 Yerkes, Francis H., S.2c to
R. T. 3c

U.S.M.C.

- 1933 Manley, William G., Lt. Col. to
Col.
1943 Alexander, Cecil A., Jr., Lt. to
Capt.

RANK NOT PREVIOUSLY PUBLISHED

- 1942 Stewart, Pearson H., Lt. (j.g.),
U.S.N.
1943 Scharff, Samuel A., Cpl., U.S.A.

CASUALTIES

- 1917 ★Robinson, Clark, Maj., U.S.A.
1938 †White, William T., Y., U.S.N.
1941 †Crane, Leon, 1st Lt., U.S.A.

** Wounded.

NEW LISTINGS

U.S.A.

- 1909 Morrill, Arthur B., Lt. Col.
1929 Mesd, Francis M., Lt.
Shriver, Raymond H., T. 5.
1932 Roberts, Frederick C., Jr., Capt.
1933 Minicucci, Rocco, T. 5.
1934 Shaffner, Aaron, Pvt.
1936 Schoettler, Frank W., Pvt.
1938 Cunningham, Charles M., Lt.
1941 Cunningham, Alan, Lt.
Hayes, Richard L., Maj.
1942 Ascoli, Giulio, Pvt.
Ashbrook, Arthur G., Jr., Pvt.
1943 Emond, Alfred A., Jr., 2nd Lt.
Kirkpatrick, Fortunatus S., Pvt.
Lephakis, Archilles J., A. C.
Nieder, Bailey H., 2nd Lt.

★ Killed in Action.

DECORATIONS IN WORLD WAR II

CONGRESSIONAL MEDAL OF HONOR

- 1924 Doolittle, James H., Lt. Gen. U.S.A.
1940**Zeamer, Jay, Jr., Maj., U.S.A.

DISTINGUISHED SERVICE CROSS

- 1911 Kenney, George C., Lt. Gen., U.S.A.
1913 †Jones, Albert M., Maj. Gen., U.S.A.
1934 ★Emery, Robert M., Lt., U.S.A.
(posthumously)
1942 Kellogg, William, 1st Lt., U.S.A.

DISTINGUISHED SERVICE MEDAL

- 1907 Fredendall, Lloyd R., Lt. Gen., U.S.A.
1911 Kenney, George C., Lt. Gen., U.S.A.
1913 †Jones, Albert M., Maj. Gen., U.S.A.
1921 Noce, Daniel, Brig. Gen., U.S.A.
1922 Johns, Dwight F., Brig. Gen., U.S.A.
1924 Doolittle, James H., Lt. Gen., U.S.A.
Henry, Stephen G., Maj. Gen., U.S.A.
1928 Kelsey, Benjamin S., Col., U.S.A.
1929 Kiefer, Dixie, Comdr., U.S.N.
1934 Robinson, James M., Lt. Comdr., U.S.N.

DISTINGUISHED FLYING CROSS

- 1911 Kenney, George C., Lt. Gen., U.S.A.
1926 Warburton, Ernest K., Col., U.S.A.
1928 Kelsey, Benjamin S., Col., U.S.A.
1936 Michel, Norman K., Sgt., U.S.A.
1941 Campbell, Thomas C., Jr., Lt., U.S.A.
1941**Fletcher, Arthur A., Jr., Maj., U.S.A.
1942 Candy, William R., Lt., U.S.A.

AIR MEDAL

- 1923 Randall, Russell E., Brig. Gen., U.S.A.
1928 Kelsey, Benjamin S., Col., U.S.A.
1933 Love, Robert M., Col., U.S.A.
1938 Guttel, John, Lt., U.S.A.

- 1941 Campbell, Thomas C., Jr., Lt., U.S.A.
1942 Candy, William R., Lt., U.S.A.
1942 Fraser, Wilton M., Lt., U.S.A.
1943**Hartvig, Douglas M., Lt., U.S.A.

AIR MEDAL (Oak Leaf Cluster)

- 1923 Randall, Russell E., Brig. Gen., U.S.A.
1941 Campbell, Thomas C., Jr., Lt., U.S.A.
1943**Hartvig, Douglas M., Lt., U.S.A.

NAVY CROSS

- 1917 Sherman, Forrest P., Rr. Adm., U.S.N.
1928 Danis, Anthony L., Comdr., U.S.N.
1929 Kiefer, Dixie, Comdr., U.S.N.
1939 Macomber, Brainerd T., Lt., U.S.N.
1940 Pieczentkowski, Herman A., Lt. Comdr.,
U.S.N.

SILVER STAR

- 1924 Doolittle, James H., Lt. Gen., U.S.A.
1927 Auchincloss, Samuel S., Jr., Col. U.S.A.
1939 Pope, Gordon A., Capt., U.S.A.
1940**Zeamer, Jay, Jr., Maj., U.S.A.
1941**Fletcher, Arthur A., Jr., Maj., U.S.A.
1941 Sieglaff, William B., Comdr., U.S.N.
1942 Bennett, Carter L., Comdr., U.S.N.
1942 Crowley, Thomas T., Capt., U.S.A.
1942 ★Kelley, Charles F., Jr., Capt., U.S.A.
(posthumously)

GOLD STAR

- 1939 Macomber, Brainerd, Lt., U.S.N.
1942 Bennett, Carter L., Comdr., U.S.N.

LEGION OF MERIT

- 1920 Ellsberg, Edward, Capt., U.S.N.
1921 Barrows, Ralph G., Col., U.S.A.

- 1921 Oster, Henry, Capt., U.S.N.
1921 Wallin, Homer N., Capt., U.S.N.
1923 Cowdrey, Roy T., Capt., U.S.N.
1924 Reinhardt, George C., Col., U.S.A.
1935 Bemis, Hal L., Maj., U.S.A.
1935 Powers, William F., Lt. Col., U.S.A.
1936 Cohen, Leonard P., Maj., U.S.A.
1938 Cagwin, Leland G., Maj., U.S.A.
1938 ★Mills, Charles R., Capt., U.S.A.
1939 Knoll, Denys W., Comdr., U.S.N.

PURPLE HEART

- 1911 Kenney, George C., Lt. Gen., U.S.A.
1921 ★Healy, Howard R., Lt. Comdr., U.S.N.
(posthumously)
1937 Kieley, Thomas J., Lt., U.S.A.
1938 Flanagan, Robert, Lt., U.S.A.
1939 Morrill, Manning C., Lt., U.S.A.
1940 DiGiannantonio, Edmond P., Lt., U.S.N.
1941 Blake, Robert W., Jr., Capt., U.S.A.
★Doughten, William S., Jr., Lt., U.S.A.
(posthumously)
1941 Fletcher, Arthur A., Jr., Maj., U.S.A.
1941 Murphy, Francis G., Capt., U.S.A.
1943 Hartvig, Douglas M., Lt., U.S.A.

SOLDIER'S MEDAL

- 1936 Knight, Edmund C., Capt., U.S.A.

AZTEC EAGLE — MEXICO

- 1927 Glantzberg, Frederic E., Col., U.S.A.

CROIX de GUERRE

- 1939 Pope, Gordon A., Capt., U.S.A.

KNIGHT COMMANDER OF THE ORDER OF THE BRITISH EMPIRE

- 1911 Kenney, George C., Lt. Gen., U.S.A.

ALUMNI AND OFFICERS IN THE NEWS

Distinction

¶ For FREDERIC H. SEXTON '01, awarded the Julian C. Smith Medal of the Engineering Institute of Canada for "achievement in the development of Canada."

¶ For JAMES H. DOOLITTLE '24, given command of the Eighth American Air Force in Britain.

¶ For WILLIAM B. BERGEN '37, recipient for 1943 of the annual Lawrence Sperry Award from the Institute of the Aeronautical Sciences for his "theoretical and experimental studies of dynamic loads on airplanes."

Office

¶ For ROBERT J. KING '03, recently elected chairman of the western Connecticut section of the American Chemical Society.

¶ For CHARLES EDISON '13, chosen national chairman of United China Relief.

¶ For RICHARD L. BOWDITCH '23, appointed emergency Solid Fuels Administrator for Massachusetts.

¶ For JOSEPH C. BOYCE, staff, named section committeeman in physics by the American Association for the Advancement of Science.

On the Scientific Front

¶ JEROME C. HUNSAKER '12, chairman of the National Advisory Committee for Aeronautics, with a warning to Congress that unceasing research must be fostered by the United States if it is to maintain air superiority over its enemies. The margin of Allied air supremacy over Germany has been so narrow, he emphasized, that Germany could conceivably repeat, in reverse, the history of the Battle of Britain.

¶ VANNEVAR BUSH '16, with the job *Newsweek* calls "gigantic — to solve problems of technical warfare, to give the armed forces of the Allies every scientific advantage, to develop new and greater weapons of death, to discover and improve medicines that would save lives, and to prepare the Army and Navy to meet any scientific menace introduced by the enemy."

¶ JOHN T. RULE '21, with perfection of a technique using the vectograph (invented by Edwin H. Land and Joseph Mahler of the Polaroid Corporation) to project pictures by ordinary apparatus on a screen where they will appear three-dimensional when viewed through polarizing goggles. The system is being used to teach aircraft navigation to military students.

¶ MARTIN J. BUERGER '24, with a paper read at a forum held at Brooklyn Polytechnic Institute in February to inform more technical men of the uses of x-ray in industry for analysis of materials, not only as to kind, but as to behavior, of the component atoms and molecules.

Postwar Plans

¶ By WALTER R. MACCORNACK '03, speaking at a postwar planning conference at Technology in January, in favor of lower mortgage interest rates, sound economic tax methods, and other principles calculated to aid in replanning and reconstructing cities and rural areas.

¶ By ERWIN H. SCHELL '12, a member of the Boston Committee on Economic Development conducting one of the many local surveys which are inquiring into the possibility of an expanded volume of business by manufacturers after the war.

¶ By WALTER C. VOSS '32, who spoke on "Post-War Construction and Materials" at the municipal "planning ahead" conference of the Mayors' Club of Massachusetts on January 28.

¶ By FREDERICK J. ADAMS, staff, who believes that the New England trend toward slower increase and future dispersal of population makes it impractical to rely on urban residential construction as a principal source of post-war employment. Federal public housing he considers too costly, slow, and limited in scope to be an adequate solution. Since we can't give everyone a new house, he thinks that "a city-wide program should be aimed at rehabilitating whole neighborhoods instead of rebuilding small sections . . . and should be completed in a reasonable period — say 10 years."

¶ By RALPH E. FREEMAN, staff, who, in an address on February 8 before the Ontario Municipal Electric Association in Toronto, forecast "a post-war slump in which between 5,000,000 and 6,000,000 workers will be unemployed in the United States alone, followed by a replacement boom and capped by a period about 1949 which will be most critical of all."

a Boston firm founded by his great-grandfather, of which he became president and treasurer in 1905. Since 1936 he had served as secretary of his Class at the Institute.

¶ FRANK I. CAPEN '88, December 30.*

¶ SAMUEL DAUCHY '88, November 19.*

¶ ADELBERT F. MEAD '88, January 23.*

¶ ROLAND N. CUTTER '89, January 28.*

¶ CHARLES B. DODGE '89, August 21.*

¶ GEORGE B. LAUDER '89, January 16.*

¶ ARTHUR C. SMITH '91, August 7.*

¶ JAMES SWAN '91, February 9.*

¶ HORACE F. RUGGLES '92, March 11.

¶ ALBERT F. SARGENT '92, January 31.

¶ FRANKLIN H. ROBBINS '94, March 12.

¶ S. ANTHONY SAVAGE '94, March 5.

¶ FRANCIS M. CONANT '96, January 23.*

¶ RALPH R. CROSBY '96, December 29.*

¶ DONALD C. CAMPBELL '98, September 24, 1942.

¶ HENRY D. OSGOOD '98, January.

¶ THOMAS M. ROBERTS '98, January 10.

¶ GEORGE C. WINSLOW '99, September 26, 1942.

¶ WILLARD W. STONE '00, February 11.

¶ FREDERICK G. CLAPP '01, February 18.

¶ ALLEN L. APPLETON '02, February 26.

¶ GEORGE T. DE COLMESNIL '02, June 23.*

¶ PAUL HANSEN '02, February 6.*

¶ WILLIAM H. HORSTMAN '02, April 24.*

¶ GARDNER ROGERS '02, December 19.*

¶ JOHN W. J. CALNAN '03, March 10.

¶ ANDREW R. COBB '03, June 2.*

¶ JOHN W. HOWARD '03, January 25.*

¶ WILFRED A. PIANE '03, October 5.*

¶ VIRGIL M. PALMER '03, February 16.*

¶ JULES V. BARND '05, January 15.*

¶ ALBERT A. ROBERTS '05, February 2.*

¶ OTTO A. JOHNSON '07, March 8.

¶ HENRY T. GIDLEY '09, March 3.

¶ CHARLES E. GREENE '10, March 8.

¶ MILES E. LANGLEY '13, January 19.*

¶ BENJAMIN WHITE '13, June 13.*

¶ CLARK ROBINSON '17, December 12.*

¶ ROBERT F. MORRISON '19, October 16.*

¶ STANLEY E. CLIFF '22, February 25.

¶ WILLIAM D. SCOFIELD '23, January 11.*

¶ SAM E. SEAGER '33, February 10.

¶ JAMES H. FERGUSON '41, January 26.*

¶ HAROLD M. REED '42, February 16.

¶ THOMAS E. MCGRATH '43, January 29.

¶ REGINALD R. GOODELL, former staff, January 23.

DEATHS

* Mentioned in class notes.

¶ STANLEY P. JEWETT '75, March 8.

¶ ALFRED S. HIGGINS '78, March 9. Soon after graduation from Technology, he joined R. R. Higgins Company,

NEWS FROM THE CLUBS AND CLASSES

CLUB NOTES

*Atlanta Alumni Association
of M.I.T.*

The Technology Alumni of Atlanta and vicinity held their annual informal get-together at "Glenwood," the home of our genial dean of Alumni, Charles A. Smith '99. A delicious baked-bean dinner was served, including all the trimmings, and a delightful evening was enjoyed by the following members with their wives: Arthur L. Jennings '97, Charles A. Smith '99, Lawrie H. Turner '99, William J. Sayward '01, Clifford S. Read '18, Roger W. Allen '27, Sidney B. Jewett '28, Leon B. Locklin '28, George M. Seal '29, Carol M. Smith '32, Edward W. May '34, and Robert N. Gilmore '36. Among the guests present were Miss Mabel Hillyer Loeb, Mrs. Margaret Jennings Harlepp, and Miss Helen Boykin. — LAWRIE H. TURNER '99, *Secretary*, 625 Sherwood Road, Northeast, Atlanta, Ga.

Detroit Technology Association

The first of our two February meetings was covered in the March Review. For the second, held on February 22 at the Stockholm Restaurant, we were most fortunate in having as speaker Arthur B. Morrill '09, who was back in Detroit on a furlough of one month. Colonel Morrill had spent the last two years in India, China, and Burma, engaged in sanitation, water purification, malaria- and mosquito-control work. Those present at the meeting listened to an extremely interesting narrative of his work during this period. Colonel Morrill was on the last clipper plane which left the West Coast and arrived at Singapore 20 days before the infamous attack on Pearl Harbor. His work in Burma and China was in behalf of the vast army of Chinese workers who were building a railroad parallel to, but at some distance from, the Burma Road. Because of the advancing Japanese army which was making use of the railroad right of way as a means of reaching China, all work on this project was stopped. Colonel Morrill was then transferred to India, where he spent more than a year on malaria- and mosquito-control work in connection with the large army camps then being erected.

Members attending the meeting were: L. E. Williams '01, A. B. Morrill '09, M. S. Dennett '11, J. N. French '11, R. S. Gans '13, F. N. Phelps '13, R. C. Doremus '14, P. C. Baker '16, T. K. Hine '16, A. C. Litchfield '17, H. J. Quilhot '17, H. C. Levine '18, E. F. Doten '19, E. A. Ash '22, H. N. Landis '23, J. H. Little '23, J. M. Campbell '25, D. B. Martin '25, M. L. Ash '26, J. E. Longyear '26, D. M. Sutter '26, D. R. Knox '27, J. V. McQuillen '28, F. H. Rutherford '28, W. J. Moody '30, J. H. Glover '31, J. A. Wilson '31, D. P. Dyer,

Jr., '32, E. L. Asch '34, A. T. Dempster '34, W. F. Rahles '34, T. F. Morrow '35, J. P. Rosenberg '38, Nicholas Williamson '40, William Cadogan '41, J. B. Davidson '42, B. S. Kingsbury '42, and W. L. Knauer '43. — DOUGLAS B. MARTIN '25, *Secretary*, 6501 Harper Avenue, Detroit, Mich.

*Southwestern Association of
M.I.T.*

On February 5 the Association held a smoker, the first meeting we have had since December, 1942. Those present numbered 40, including six new members and five guests. The speaker was Charles Nutter, head of the Associated Press office in Kansas City, Mo., which is the third largest in the country, outranked only by New York and Washington. Mr. Nutter spent several years in Moscow as Associated Press correspondent. His talk was informal — for the most part he answered questions — and it proved exceptionally interesting as well as informative. In Mr. Nutter's opinion, Russia will emerge from the war as the first-ranking power of the Continent.

Following the address, J. C. Turney showed a Kodachrome movie, "Springtime in the Rockies," taken during the summer of 1942. Mr. Turney is one of the leading amateur photographers in this section, having had his work presented at the Eastman Kodak exhibit at the New York World's Fair, as well as at many of the leading salons throughout the country. His "Springtime in the Rockies" outclassed many professional films in the opinion of most of the audience. After the picture, we enjoyed beer, Jim Irwin's Royal Crown Cola, and sandwiches.

I should like to take this opportunity to ask all Alumni coming into this district to get in touch with me, especially if I may be of assistance to them in any way. — REGINALD W. BULKLEY '27, *Secretary*, 840 Westover Road, Kansas City 2, Mo.

The Technology Club of New York

Members recently admitted to the Club are the following: Ralph A. Fletcher '16 of the H. E. Fletcher Company, West Chelmsford, Mass.; David M. Broudy '22, who practices law at 17 East 42d Street, New York City; H. H. A. Razzack '24 of the Otto Gerdau Company, New York City; James R. Killian, Jr., '26, Executive Vice-president of the Institute; and Dwight K. Luster '26 of the Hathaway Manufacturing Company, New Bedford, Mass.

Our annual luncheon with the Technical Association of the Pulp and Paper Industry brought out a group from all over the country. These luncheons are providing a means of seeing some of our old friends whom we otherwise don't see from one year to the next. Robert W. Van Kirk, Jr., '18 was elected chairman for the coming year.

Dr. and Mrs. Compton were guests of honor on March 25 at our housewarming and inspection of the new ladies' lounge and dining rooms, as well as the balance of the completely redecorated and refurbished clubhouse. — WILLIAM D. NEUBERG '17, *Secretary*, 24 East 39th Street, New York, N.Y. WILLIAM L. KEPLINGER, JR., '24, *Publicity Committee*, c/o Johns-Manville, 22 East 40th Street, New York, N.Y.

*The Technology Club of
Rochester*

James R. Killian, Jr., '26, Executive Vice-president of the Institute, was our guest speaker on February 10. Mr. Killian, on his first visit to Rochester, divided his day between the Eastman Kodak Company and the University of Rochester. Then, at our supper meeting, he discussed "The Little Red Schoolhouse — 1944 Style." Even those who never saw the Institute in the glow of its crimson floodlights ("gift" of some vandals several years ago — perhaps from other parts of Cambridge) had no trouble identifying the general outlines of the Little Red Schoolhouse with Technology. Most of the details, however, were unfamiliar.

Mr. Killian told first of the many activities now centering about the Institute — the training programs, the research projects, and the numerous extracurricular activities of the Faculty. He then went on to the plans for education after the war, mentioning groups of former students, service trainees, and others who will want to come to Technology, and the preference each group will have. One of the many problems will be to build up an adequate staff for instruction during this peak enrollment without leaving the Institute top heavy for the next several decades. So interested were the Club members that the meeting broke up very gradually and Mr. Killian still had a small audience about him when the time came for him to leave.

Howard Gardner '30, President, introduced John R. Cook '38, captain in the Signal Corps and traveling representative at Technology clubs in the eastern sector. He also announced plans for the next meeting: a Saturday evening dinner dance at the University Club on March 25.

Others attending the February meeting were: F. W. Lovejoy '94, P. B. Wesson '98, A. F. Sulzer '01, J. F. Ancona '03, M. H. Eisenhart '07, L. L. McGrady '17, E. S. Farrow '20, J. C. Aronson '22, C. K. Crofton '22, K. M. Cunningham '22, Andrew Langdon '22, W. R. Scott '22, H. M. Shirey '22, H. H. Leary '23, S. P. MacDonald '23, E. H. Miller '23, C. J. Staud '24, Lee McCanne '27, G. E. Francis, Jr., '28, K. J. Mackenzie '28, J. N. Cooper '30, Gregory Smith '30, S. C. Wells '30, R. M. Wilson '30, W. H. Strain, Jr., '31, Gordon Levinson '32, F. J. Kolb, Jr., '38, C. H. Alexander '39, H. L. Smith, Jr., '39, H. A. Bing '40, R. G. Talpey '40, and A. S. Knight, Jr., '42. —

FREDERICK J. KOLB, JR., '38, *Secretary*, Building 14, Kodak Park, Rochester, N.Y.

Technology Club of Schenectady

Our dinner at the Mohawk Club on January 25 was attended by 35 Alumni from this vicinity and two from Canajoharie. As guest speaker, Samuel C. Prescott '94, Professor of Industrial Biology, emeritus, discussed recent activities of the Institute and showed motion pictures. Arthur J. Tacy '27, President, was in charge, and Theron C. Johnson, '33 Secretary, led a discussion of postwar education. Plans were made for a luncheon in March.—THERON C. JOHNSON '33, *Secretary*, General Electric Company, 1 River Road, Schenectady, N.Y.

Washington Society of the M.I.T.

The Society met at 6:15 on the usual second Thursday, February 10, at the Y.W.C.A. on 17th and K Streets, for its dinner meeting, with Merton L. Emerson '04 presiding. Major General Philip B. Fleming, administrator of the Federal Works Agency, was a most interesting speaker. While he disclaimed any intention to talk on postwar problems of public works, his reminiscences accomplished the purpose by farable.

Between 1923 and 1926 in the Office of Chief of Engineers, in co-operation with Colonel George Spaulding, General Fleming developed a cost system to achieve more nearly accurate estimates, because the office was required to undertake projects with hired labor when its estimates were 25 per cent below the lowest bid. From 1926 to 1933 in charge of athletics at West Point, General Fleming handled large sums, with a net profit in one year of \$750,000. In 1933 Colonel Spaulding called him to Washington, and he became executive officer, and later deputy administrator, of the Public Works Administration. Following the rapid construction of 6,000 houses in Eastport on the Passamaquoddy project, General Fleming was called back to the Resettlement Administration, subsequently into the Corps of Engineers at St. Paul, then back to Washington to the Wage and Hour Division, and finally to replace John Carmody, who was ill.

From the experiences gained in the Public Works and Civil Works administrations, he pointed out, we have learned that we cannot put people to work advantageously while the work is still being planned, and it is evident that we should blueprint our postwar projects to provide a shelf of work. If such a shelf is prepared and becomes public knowledge, business will gain confidence to develop its own projects, General Fleming believes, and the shelf may never have to be drawn upon. He listed a number of projects suggested in the early days of the Civil Works Administration, such as \$40,000,000 seadromes with hotels; a continuous landing field from New York to Chicago, in spite of the intervening Alleghenies; a sea-level canal from Duluth to Seattle, in spite of the Rockies; and a concrete flume from St. Paul to New Orleans. Another suggested project, harnessing the tides, in his opinion is still feasible. He discussed a function of the Federal Works Agency in tying in projects of the Public Roads, the Public

Buildings, and the remnants of the Public Works administrations, and its position in administering the Lanham Act.

No concrete postwar bill has come from Congress, but he hopes that the Lanham committee may produce the shelf of blueprints of public work needed after the war. He mentioned the excellent job New York City has done in detailed planning. Queried as to the most desirable quality in an administrator, General Fleming said it was a difficult question. He thought much of his success had been due to his ability to draw a distinction between the line organization and the staff organization, in the projects with which he has been associated.

The following Technology men attended: 1889: G. W. Stone; 1890: J. G. Crane, W. B. Poland; 1892: B. P. Du Bois; 1893: P. H. Thomas; 1896: H. G. Hamlet, Bradley Stoughton; 1897: P. L. Dougherty; 1898: Martin Boyle; 1900: C. H. Stratton; 1903: W. L. Cook; 1904: M. L. Emerson, A. M. Holcombe, F. W. Milliken, G. H. Shaw, G. N. Wheat; 1905: O. C. Merrill; 1907: J. P. Alvey, E. W. James, Alexander Macomber; 1908: P. H. Heimer; 1911: C. P. Kerr, W. H. Martin, C. G. Richmond; 1912: F. W. Barker, A. M. Pedersen, R. E. Wilson; 1913: R. M. Wilson; 1914: A. E. Hanson; 1917: J. P. Ferrall, W. C. Mehaffey; 1918: H. D. Manuclian; 1919: A. H. Blake, L. J. Grayson, M. P. Smith; 1920: John Nolen, Jr.; 1921: L. W. Conant, W. C. Hagerton, Richard McKay; 1922: H. H. Fisk, G. R. Hopkins, W. K. MacMahon, C. A. Moore, J. R. Morton, Jr.; 1923: J. D. Arthur, Jr., C. M. Bouis; 1924: P. C. Maynard, W. D. Rowe, R. P. Schreiber, W. W. Sturdy; 1925: C. H. Hosmer, H. B. Swett; 1926: S. J. Cole, T. L. Soo-Hoo, Mary O. Soroka; 1927: E. G. Cowen, D. F. Horton; 1928: A. E. Beitzell, M. W. Keyes, G. D. Mock, W. B. Moore; 1929: N. P. Stathis, G. R. Williams; 1930: A. F. Bird, J. R. Bloom, C. W. Maskell, J. A. Mathews, N. C. Nelson, F. W. Turnbull; 1932: G. A. Lowery, L. M. Moses, F. M. Moss, R. S. Prescott; 1933: J. F. Longley; 1934: G. S. Hammonds, G. E. Westerfeld; 1935: J. A. Bradshaw, B. D. Mills, Jr., Richard Lawrence; 1936: C. E. Crede, H. C. Johnson, H. F. Lippitt, 2d, G. D. Mylchreest, W. B. Sharp, Jr.; 1937: E. A. Ferris; 1939: R. W. Arentson; 1940: B. F. Greenberg; 1942: Z. W. Wilchinsky. —FRANK W. MILLIKEN '04, *Secretary*, 613 North Greenwich Street, Falls Church, Va. WILLIAM K. MACMAHON '22, *Review Secretary*, Rosslyn Gas Company, 3240 Wilson Boulevard, Arlington, Va.

CLASS NOTES

1887

The Class held its 67th reunion since graduation at the Hotel Statler on Saturday, February 26. Out of 11 members now living, there were present Beeching, Clarke (President), Kittredge (Secretary), and Sherman. All of those living had been invited to be the Secretary's guests at this meeting, and each had replied to the invitation. Of those not present, four are practically shut-ins; two live too far away; and one, because of gas shortage and inability to ride busses, could not come.

Informal reports were made of the deaths, since our last gathering, of Holman and Wood. Items of personal interest in regard to Wood were quoted from family letters. Up to the present time information in regard to Holman has not been forthcoming, so that extended comments on his life, achievements, and character cannot yet be written. It is believed that through this meeting '77 has maintained its unbroken record of yearly reunions since graduation. —GEORGE W. KITTREDGE, *Secretary*, 592 North Broadway, Yonkers 3, N.Y.

1887

N. P. Ames Carter writes from Delray Beach, Fla., where he and Mrs. Carter have been sojourning, that the thermometer registered 80 degrees for a whole week but that they liked it and were glad to be able to be there. Dick Schmidt's firm is still very busy with work scattered over North Carolina, New Jersey, Michigan, Ohio, Indiana, Kentucky, Illinois, and Colombia, South America, in addition to handling inquiries from other states. Dick's granddaughter, Marianna Gallauer, who attended our 55th reunion at Plymouth in 1942 in company with her distinguished grandsire, will be graduated from Wellesley in May. This event may result in Dick's decision to attend the event and stop over a few days later for our class reunion, which we hope will be held in Plymouth again this year.

Frank Brett announces the recent arrival at Crooked Lane Farm of a grandson of whom they are all very proud. Frank enjoys the winters in Duxbury, except when a deep snowstorm involves overmuch shoveling, and he already has his victory garden planned for the coming season. We hope to see him again in June.

Cole, Kendall, Tripp, and Very represented the Class at the Alumni Dinner on February 26, sharing the table with E. V. French, F. W. Hobbs, L. W. Bridges, W. W. Lewis, and E. L. Brown, all of '89. The affair was unusual and most interesting, and was greatly enjoyed by all. —NATHANIEL T. VERY, *Secretary*, 15 Dearborn Street, Salem, Mass.

1888

Fourteen years ago Theodore A. Foque conceived the idea of building locomotives at the Shoreham shops of the Soo Line, Minneapolis. For nearly 50 years he was general mechanical superintendent of the road, which covers 4,300 miles in six states. The shops cover 200 acres with 20 buildings and 1,400 employees. The first three locomotives cost a quarter of a million dollars. Number 4018, the first of the three, weighed 555,000 pounds, and more than a thousand persons were present at the "christening," presided over by Foque as master of ceremonies. He had supervised every detail of the huge mechanical job from start to finish. This work kept many of the employees busy during the otherwise slack season when they would have been reduced to part-time jobs. All the men in the shops who worked under Ted agreed on one point, namely, that he was a "wonderful boss."

Special awards for single red and double pink japonica were made to Edwin S. Webster at the January flower show, according to the Boston *Herald*. Samuel

1888 Continued

Dauchy, with us during our junior and senior years, died on November 19 at 4455 Hermosa Way, San Diego, Calif. He had been with the Dauchy Iron Works, 223 West Illinois Street, Chicago. We had not heard from him for some time.

During his sojourn in Florida, Sanford Thompson, our pinch-hitting Secretary, stayed at the Hillsboro Club at Pompano, where he met a good many outstanding men. He went in swimming nearly every day and played golf at clubs about 15 miles away. He says that he had a fine time, with no ill effects from overexposure to the sun. John Runkle is "Johnnie on the spot" for the Class, for when all of our Secretaries hie themselves southward to Jersey and Florida, he "sticks to the ship" and "carries on" like the veteran sailorman that he is. He was the class representative at the home services for Adelbert Mead on January 25 in Arlington and was responsible for the spray of gladioli sent in the name of the Class.

Adelbert F. Mead died at his home on January 23 after a short illness. He had been a resident of Arlington for 30 years and previously of Somerville for 25 years. He was born in West Acton and was graduated from Chauncy Hall School with Arthur T. Bradlee and other distinguished members of our Class. His entire business career was spent with A. and O. W. Mead and Company, commission merchants of the old Faneuil Hall market. His summer home since boyhood days was at Oak Bluffs, Martha's Vineyard. He leaves his wife, five children, and four grandchildren, one of whom is now in the Navy. Among the honorary pallbearers were his three sons, four nephews, and his Navy grandson. He was always at our class reunions and was an outstanding example of a kindly gentleman. He will be missed.

Plans are now under way to rejuvenate the Hill Crest Hotel at Chebeague Island, Maine, where we held our 40th reunion in '28, so that it will be open for guests early in July. — Your Secretary was "caught in the draft" for "University Town," a film showing wartime activities of an American college community which has started production in Princeton for the Co-ordinator of Inter-American Affairs. It is being made for Latin-American consumption. Albert Einstein "also" appears in the picture. — BERTRAND R. T. COLLINS, *Secretary*, 39 Wiggins Street, Princeton, N.J. SANFORD E. THOMPSON, *Assistant Secretary*, The Thompson and Lichtner Company, Inc., 620 Newbury Street, Boston 15, Mass.

1889

The Secretary missed sending his last batch of news. Alibi: He caught a pneumonia bug and spent three weeks in the hospital, beginning December 19. Like his colleague, Winston Churchill, he is now out again and back at work. Through Parker Fiske, the Secretary has heard that James P. Gilbert is holding his own, is up and around, and gets out of doors for a few minutes each day. With Mrs. Gilbert he took a small apartment at Harvard, Mass., for the winter months. Parker himself writes that he is pretty much confined to his room but evidently feels well and cheerful. His Stix business is booming — his production is up to nearly one million Stix for the year, and they go all over the coun-

try, including Alaska and Hawaii. He directs this business by telephone from his easy chair. This shows that '89 men cannot be kept down, no matter what.

George B. Lauder died on January 16. The Boston *Post* had the following mention: "... George B. Lauder, 77, former manager of the Concord Electric Company in Concord, and the first New Hampshire man to graduate from Massachusetts Institute of Technology ... died ... at his home in Sanbornton." — Charles B. Dodge of Seattle, Wash., died on August 21, and Roland N. Cutter of West Roxbury died on January 28. At present the Secretary has no particulars in either case.

The following letter from Annie G. Rockfellow was dated December 5: "Holiday time would not be complete without one of your cute little sketches. I have quite a collection. Thanks for them all. ... I had hoped to go East in '42, but travel became too uncertain and complicated, and still is; so I am happy to be marooned in such a lovely place as Santa Barbara, but expect to spend the holidays in Glendale with my brother at his son's. My niece and family will probably join us on Christmas Day. I've had a lot of fun giving a talk (six times) on Arizona Indians; I wear an Indian costume and enter with an Indian yell, brandishing a war club. Best wishes for Christmas and all time. Greetings to any of the 'Old Boys' from Rocky." The Secretary would enjoy seeing that Indian!

Joseph E. Chandler's address is Water Row, Sudbury, Mass. — WALTER H. KILHAM, *Secretary*, 126 Newbury Street, Boston 16, Mass.

1891

Our friend and classmate, James Swan, died suddenly on February 9 in Washington, D.C. A letter from George Spooner mentioned seeing a report of his death in some newspaper, which was the first we knew that he had passed on. Only two weeks before, Jim had written us that because of the trouble with his eyes, he didn't move around much but he did get to work almost every day, and he had attended the meetings of the Washington Society of the M.I.T. A few years ago he had bought a house in Georgetown, where he lived with his daughter until she married a year ago. In November he went to New York to attend the 50th anniversary meeting of the Society of Naval Architects and Marine Engineers. He was one of the original members in 1893. There were ten 1893 "survivors" present at the meeting. They were presented with 50-year certificates and given a royal good time as special guests of the society.

We were all very fond of Jim. He came to our parties whenever he could, including our fiftieth, when he seemed in good shape except for his eyes, which have given him trouble for some time. He was secretary of our Class as a junior and senior, and retained his interest throughout the years. Although working under difficulties, he continued to be useful to our government because of his unusual experience in shipbuilding, and "he fought a good fight" right up to the end.

Jim was always modest about his shipbuilding activities, and even those of us who knew him quite well will be surprised

at the following story printed in November in the Washington *Times-Herald*: "He has served his country through three wars, either building or ascertaining the seaworthiness of the ships that have fought the battles. The beginning of the Spanish-American War found Boston-born James Swan a brand new naval architect, one of the very few in the country. He had but recently completed his studies in engineering at ... Technology and in naval architecture in Glasgow. Because someone had to build the ships with which to win the war, he didn't wear a uniform or acquire any decorations. But, health conditions being what they were in Newport News in those days, young Swan did acquire a case of malaria.

"The war over, he kept right on designing and building ships, taking only a few years off to help establish and then to teach in the naval architecture school of M.I.T. World War I arrived, and Swan was the manager of the shipyard that built many a submarine chaser that sent German U-boats to the bottom.

"Now the celebrated architect is 73 years old. But he's still right in there pitching for the war effort. This time he's the principal engineer for the Division of Marine Inspection of the U. S. Coast Guard. Soft-spoken and very dignified, he goes quietly about his work of examining the designs submitted for engines, boilers and piping for merchant ships to ascertain that they are sturdy enough to withstand the rigors they'll be subjected to during their time at sea.

"'It isn't as exciting work as designing and building ships, you know,' he commented with a smile while he lifted one of his beloved pipes from his mouth for a moment. 'But, of course, they really don't build ships any more, they manufacture them. In the old days every ship had a personality. I couldn't pick up a newspaper that I didn't read about some ship I'd either built, traveled on or knew about. It isn't that way today. But anything connected with shipping still fascinates me, and I guess always will.'"

In our last notes we mentioned the death of Arthur Carlton Smith but had no information regarding his lifework. We now quote from an article in the *Poultry Herald* of St. Paul, Minn.:

"Arthur Carlton Smith, for nearly quarter of a century Professor of Poultry Husbandry and Chief of the Poultry Division of the University of Minnesota, passed away ... August 7, at his home, 2116 Knapp Street, St. Paul ... at the age of 76, after an illness of several months. Professor Smith was born in 1867 at Athol, Massachusetts. He obtained his education in the public schools of Worcester in the same state, and at ... Technology. ...

"Not in good health when he graduated, he did not take up the work for which his education had fitted him but engaged in the breeding of Standard-bred poultry, in which he had always been interested. A little later he became manager of Grove Hill Poultry Yards, located at Waltham, Massachusetts, and owned by William Ellery Bright, well known Boston stock broker and poultry fancier. ... Under his management Grove Hill became one of the leading winners on Barred Plymouth Rocks and Single Comb Brown

1891 Continued

Leghorns in the most important poultry shows of the United States and Canada.

"Professor Smith joined the American Poultry Association in 1898 and was closely associated with its activities during most of his life after that time. His ability as a breeder, exhibitor, and judge, and his knowledge of the poultry industry in general, attracted wide attention, and in 1912 he was called by the University of Minnesota to be its first Professor of Poultry Husbandry. He served in that capacity until 1936, when he reached the age limit and retired with the title of Professor Emeritus. During his 24-year connection with the University he rendered an unusually useful service to the poultrymen of Minnesota, and to those of the entire nation."

John Putnam wrote me from West Haven, Conn., that he hears from Hanning-ton and Bradlee off and on but has not seen any '91 men recently. He doesn't want to brag about his health and feels that our age is a good excuse for a general letdown. Come to one of our parties, John, and we will show you some pretty fair specimens of activity. — We heard from Horace Ensworth in Hartford recently. He said that he had been having a several weeks' hospital experience but was getting around again. He had nothing "startling" to report, but felt abused to be "soaked" with taxes and hospital bills at the same time.

John Damon planned to leave for the Pacific Coast to visit his daughter. We have not heard from either the Florida or California groups since the last notes, but may have something for the next issue. — HENRY A. FISKE, *Secretary*, Grinnell Company, Inc., 260 West Exchange Street, Providence, R.I.

1896

The '96 table at the Alumni Banquet at the Hotel Statler in Boston on Saturday evening, February 26, was nicely filled by Damon, Davis, Driscoll, Grush, Hersey, Howard, Hultman, Rockwell, and Rundlett. Sam Hunt was also near by at the '95 table, and the Secretary, much to his misfortune, was relegated to the head table on the stage. He was unable to gather any items of news from the group. They all seemed to be well and happy.

The Secretary attended the annual convention of the American Institute of Mining and Metallurgical Engineers in New York City from February 21 to 24 inclusive. Rockwell came over from Boston for the annual get-together of the Class in the President Tavern on Wednesday evening, February 23. Billy Anderson had read about it in *The Review* and had arranged his trip from Cincinnati so as to be in New York at that time and incidentally see his son William G. Anderson '41, who is in the Navy and was being put in charge of a larger ship than he had previously. Present at the class dinner were Anderson, Bakenhus, Dorrance, Gaylord Hall, Locke, Rockwell, Rutherford, Stevens, Tilley, and Trout. It was a most enjoyable occasion, as these annual gatherings always are under the anonymous management of Bakenhus, Sager, and Tilley. Each one claims that the others do all the work, but perhaps it has some significance that the notices of the meeting came out over

the signature of Rear Admiral Bakenhus and that John Tilley orders with authority.

In the course of the dinner Bakenhus read some post card replies that he had received: Arthur Baldwin from Charlottesville, Va., sent greetings and best wishes, and expressed the hope that some year we might forgather in Charlottesville. Dr. Freedman had hoped to be present but at the last minute was unusually busy and did not find it possible to come all the way down from the upper reaches of Manhattan Island. Charles Hall and Ruckgaber were under the weather at the time of the meeting and did not dare to come. Warm greetings and regrets were sent by Charlie Lawrence from Baldwinsville, N.Y., and Paul Litchfield from Akron was very sorry that he was unable to attend. Jim Melliush reported that he was doing war emergency sanitary engineering for the New York State Department of Health with headquarters in Poughkeepsie, where he had been since the latter part of December. Jim almost cried over his inability to be present. Walter Stearns sent a nice note from Punta Gorda, Fla., which contained the cheerful (?) information that he would miss all future winter dinners because of his retirement from the General Electric and his plans to spend the winter months basking in the sun and enjoying the warm weather of the South. Another sad feature of his note was his anticipation of being forced on the water wagon or else going broke because of inability to purchase Scotch or rye anywhere in Florida except at a price prohibitive for all but millionaires.

No reply had come to Bakenhus from Partridge and it may be that because Partridge now has a new address at Jericho, on Long Island, the notices of the meeting failed to reach him. Bakenhus himself had been on a trip to New Orleans, and in fact when the Secretary got back to Boston, he found a card which Bakenhus had mailed in New Orleans. The Admiral told of the difficulties he met in flying back and the number of times his plane was grounded, or almost grounded, but he finally made it. Sager had definitely counted on being with us and every preparation had been made for him, but unfortunately some little bug moved in on him and forced him to stay at home under the doctor's care on the day of the dinner. We all fully understood the frame of mind that he was in and sent him our written greetings to cheer him up. The latest word from him is that he is back on the job in his New York office after an attack of intestinal flu, which he admits was the result of overdoing, over-exposure, and carelessness in eating. It is expected that in future years Sager will be put on a strictly regimented diet and system of preparation by Tilley for a period of at least two weeks prior to the dinner and meeting. One item of news the Secretary picked up was that John Tilley had the misfortune to suffer a broken arm a while ago, but was equally fortunate in making a good recovery, which goes to show that it is practically impossible to injure permanently a tough bricklayer.

While in New York the Secretary caught a glimpse of Will Coolidge one morning at breakfast in the Hotel Commodore, but was successful in having only a brief conversation with him over the telephone, as

Will and Mrs. Coolidge were leaving immediately to return to Schenectady. Through kindness of A. J. Tacy '27, President of the Technology Club of Schenectady, there has come into the hands of the Secretary an excerpt from the December-January issue of the *G-E Monogram*. This contained the first of a series of articles dealing with the careers of company officials, and it is significant that Dr. Coolidge has been selected to be No. 1 in the series of presentations. The article includes an excellent full-page rotogravure picture of Dr. Coolidge and two full pages of stories of his life and work, covering his many inventions, accomplishments, and honors.

At the A. I. M. E. meeting the Secretary saw Bradley Stoughton and had a brief chat with him. Bradley was wearing a watch charm which had recently been presented to him. The Secretary got a rather hasty account of an event at Lehigh University on February 4 which was named "Stoughton Night," featuring a meeting of the American Society for Metals at which Marcus A. Grossmann '11 was present and gave a talk. Stoughton promised to send the Secretary full details in time to appear in these class notes, but they have not arrived. Hence this account may be garbled and even inaccurate. The Secretary understands, however, that the watch charm which Stoughton was wearing is the first of a series of past-president medals, and also that Stoughton Night is to be an annual affair and that awards in the form of silhouette plaques of past Presidents would be a feature of these annual Stoughton Nights. Further and perhaps more nearly correct information will appear in the next issue, by which time it is expected that Bradley's contribution of information will have become available.

Another announcement regarding Bradley is that a subscription dinner in honor of Dean Bradley Stoughton, on the occasion of his retirement from active teaching duty as professor of metallurgy, is being planned for April 15 at Lehigh University. This will take the form of a stag dinner at the Hotel Bethlehem in Bethlehem, Pa. To avoid loading transportation facilities in these days, the dinner is planned as a local affair but with the suggestion that friends from any distance who might desire to attend the dinner write letters of appreciation instead and address such letters to the Secretary, Department of Metallurgical Engineering, Lehigh University, Bethlehem, Pa. The letters will be bound into a permanent volume to be presented to Dean Stoughton. No special invitations are being sent for this affair, and this public announcement is to be considered as an invitation to any and all who may desire to attend or write a letter.

A letter from Joe Harrington reveals that he has been simply swamped with work because of the tremendous pressure for coal production. His process, which involves the use of silica to prevent clinking of ash, is being used as standard practice by his company on 3,000 tons of coal a day, and his paper describing the process was printed in full in the *Journal* of the British Institute of Fuels. Joe has summarized the high spots of his career by stating that he has been the designer of the Green

1896 Continued

Chain grate and 600 installations, of the Harrington stoker and 300 installations, of the Whiting stoker and 200 installations, of the Harrington heater, which is a mechanically stoked, coal-fired boiler for residences, and of the Harrington boiler, which is a sectional, water-tube domestic boiler for oil or gas fuel. He was formerly administrative engineer of the United States Fuel Administration for Illinois, in charge of coal conservation in 13,000 power plants; formerly advisory engineer in power-plant design, operation, and efficiency; and formerly presidential member, Bituminous Coal Code Authority, Division 11. He is a member of the citizens' technical advisory board, department of smoke inspection, Chicago; honorary member, National Association of Power Engineers; reviewing editor of the Hays School of Combustion textbooks; and lecturer and writer on air purification, smoke elimination, and combustion of coal. He is the author of *The Burning of Coal* and was formerly advisory engineer with the Commercial Testing and Engineering Company. He is now research engineer with the Northern Illinois Coal Corporation in Chicago dealing with coal utilization, combustion, and preparation. He was appointed in 1943 as general consultant for the United States Solid Fuels Administration for War and also advisory engineer for the United States Army's coal conservation program. In February, 1940, he received the Modern Pioneer award from the National Association of Manufacturers, selected by Dr. Compton as chairman of the committee on Modern Pioneer awards.

Jacobs reports glorious winter weather in Burlington, Vt., with some snow and the final freezing over of Lake Champlain. He is scheduled to retire from teaching on July 1. — Jim Driscoll has called the attention of the Secretary to page three of the issue of *Engineering News-Record* of February 3, where is shown a picture of the new board of direction of the American Society of Civil Engineers. It is of especial interest because Bakenhus and Trout are both there pictured.

That the midwinter period is past is evidenced by the appearance of Con Young's annual New Year epistle from the South. At the time he wrote, the latter part of January, Con said that he was recovering from four weeks of wrestling with the flu. He described his living conditions and surroundings in detail and sent some excellent snapshots showing Con, Abby, Irv Merrell, and the dog Roody. Abby is busy in Girl Scout work in St. Petersburg, thus carrying on the work which she started in Washington with Mrs. Hoover in the White House. Con spoke of our loss of Buster Crosby, who will be very much missed by Con and Abby when they return to Cape Cod in the spring. The flu has been prevalent in Florida, and the succession of long, cold, wet days seemed to prolong the attack on both Con and Abby, but at the time he wrote they were both able to sit out on the porch in the warm sun of the first warm day they had had in six weeks.

A letter from Myron Fuller reported that after bringing Mrs. Fuller's remains to Brockton for interment he had returned to Rockport, Texas, to stay until about the first of May, when one of his brothers will go to Texas to drive back East with Myron.

W. H. Thomas, who with Mrs. Thomas runs the St. Christopher School in Westfield, N. J., writes that one of his sons is in the Air Forces at Salt Lake City and the other is in the Navy Reserve Officers' Training Corps, being three-quarters of the way through his course at Yale.

Amos G. Robinson wrote from San Juan, Texas, modestly saying that he had not performed any Big Inch deeds, but that he and his assistant are busy setting stakes for resubdivisions of the irrigation district lines and grades for drainage ditches, canal levees, and pipe lines. "Big Rob" says that the irrigation district has been so well worked over that now he rarely has to design any wood or concrete bridges or hydraulic construction, the last job of that nature having been for the torpedo nets in front of the suction of the pumping plant two years ago. At the time he wrote, Rob was hoping to get to make a call on Fuller in Rockport.

The newspapers have recently been carrying paragraphs on Paul Litchfield, giving Paul's views on the postwar rubber industry. Paul feels that the prospect is very bright for a healthy growth of the rubber industry. The war has greatly increased the facilities of the tire plants, and a great supply of basic material, both crude and synthetic rubber, will be available to stimulate inventive genius to expand production of new rubber products. This expansion, which was halted by the war, will be resumed and greatly accelerated when the war is ended.

Francis M. Conant died in Brookline, Mass., on January 23. Conant was graduated in Chemical Engineering and went with the Mathieson Alkali Works in Niagara Falls for a while as chemist, but he had been living in Brookline for many years. He left a sister, Miss Abby B. Conant, and four nephews. He had not appeared at any class or Technology gatherings for years, and no information is available regarding his recent work and activities. — CHARLES E. LOCKE, *Secretary*, Room 8-109, M.I.T., Cambridge 39, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge 38, Mass.

1901

The December issue of *Kodak*, the magazine of the Eastman Kodak Company, Rochester, N.Y., has the following to say about one of our classmates: "Albert F. Sulzer, who had been general manager of the Company since May, 1941, was elected to the office of vice-chairman of the board of directors. . . . Mr. Sulzer joined the staff of the Chemical Laboratory at Kodak Park on August 1, 1901, soon after his graduation from . . . Technology. He was the only graduate chemist in the laboratory at that time and one of about a half dozen in the entire plant. Shortly, he was appointed head of the laboratory and he remained in that post until 1905 when he was made head of Powder and Solutions — a job that was distributed between Kodak Park, State Street and Hawk-eye, and 'had me hopping all over the place', he likes to recall.

"In 1920, Mr. Sulzer was made assistant general manager of Kodak Park, and in 1929 he was appointed general manager of the Park. He was elected a director of the Company in 1932 and a vice-president in

1934. In 1936 he was appointed assistant general manager of the Company; and in 1941 he was appointed general manager. As a veteran of 42 years' service Mr. Sulzer has watched Kodak Park come up from the time when it was just getting under way."

Because of the difficulty in attending meetings, Al recently resigned from the New York State War Council, of which Governor Thomas E. Dewey is chairman. He was an original member of the New York State Defense Council, which was changed to the New York State War Council when we entered the war.

Ralph Whitman sent me a clipping from the December issue of *Civil Engineering*, in which A. John Eveland announced the removal of his mining engineering practice from Reno, Nev., to the Russ Building, San Francisco. — Phil Moore forwarded his copy of the *Newcomen Bulletin for North America*, reporting the election of William Vermilye to the post of president of the British Newcomen Society. Although this event was covered pretty thoroughly in these notes recently, a few excerpts from the bulletin to show what they have to say about their new President may not be amiss: ". . . During two decades, Mr. Vermilye has rendered brilliant service to American Newcomen. His work has taken him throughout the United States and into many countries abroad. He knows the United Kingdom well; has numerous friends in Great Britain. His brilliant 'Power in the Textile Industry', a Newcomen Address, is an important text in its field."

When he sent Ted Taft the Worcester, Mass., news clipping from which we are about to quote, Obie Denison '11 appended the notation that George Cross, XIII, was one of 15 or 20 local leaders who were asked their opinion on war prospects. Here is part of the article: "Capt. George I. Cross, director of the Worcester Historical Society, who had a brilliant record in France during the first world war, believes that the current bombings are merely a softening up process for a mighty three-way invasion.

"I think Germany will be forced to capitulate not later than the early Fall of this year. The softening up process is now taking place by repeated bombings from the Allied air forces, which will have a very important effect. These will be followed by invasion from west, east and south. The eastern invasion is a continuation of the present Russian offensive which will be extended to the north to the shores of the Baltic Sea. The western invasion will be by the Allied armies at present located in Britain and will be across the channel and North Sea. The southern invasion should be by the French Army of North Africa using Sardinia and Corsica as stepping stones to the southern coast of France into the vicinity of Marseilles."

"The present Italian campaign was valuable in taking Italy out of the war as an active enemy and continues valuable in keeping large forces of the enemy engaged outside of Germany proper. If the whole peninsula were overrun, the line of the Alps to the north will provide a fine defensive position for the German Army, a line which would be most difficult to break.

"After the war, aside from punishing the German criminals responsible for the war and its atrocities, the district of East Prussia with its turbulent Junker overlords

1901 Continued

should be given to Poland together with the littoral about Danzig. Germany should be further despoiled of Silesia which should be split on the line of the Oder River, all north of it going to Poland and the land to south reverting to Austria, its original owner. This would strengthen both Austria and Poland against threat of future aggressions from the west."

Having left Will Farnham in a hospital in the last issue of these notes, I am glad to be able to report that he is up and out again. He submitted to a serious but successful operation, and after staying in the hospital nearly four weeks, he returned to his home in East Orange, N.J., on Christmas day minus considerable weight, among other things. He has been gradually adding to the length of his daily walk and expected to attempt a trip to New York City soon. Farnham called my attention to a February 18 Associated Press dispatch from Chickasha, Okla., reporting the death of Frederick G. Clapp, XII, which I regretfully quote: "Dr. Frederick G. Clapp of Bronxville, N.Y., internationally known geologist and consultant to many foreign governments, died here today of spinal meningitis. He was 64 years old. . . . Dr. Clapp, who made the first map of Oklahoma oil fields twenty-five years ago . . . recently returned to the United States from Turkey, where he was petroleum consultant to the Turkish Government. Dr. Clapp was born in Boston and received a B.S. degree at the . . . Institute . . . in 1901. He was employed there the same year as a geology instructor and two years later joined the United States Geological Survey. After six years he left to practice as a consulting geologist and petroleum engineer, specializing in reports on oil and gas properties. This had been his work ever since. He worked in Canada, for the Department of Mines (1911 and later), in China (1913-15) and in Australia, where, from 1923 to 1925 he headed the Commonwealth's official search for oil." — GUY C. PETERSON, *Secretary*, 788 Riverside Drive, New York 32, N.Y. THEODORE H. TAFT, *Assistant Secretary*, Room 3-266, M.I.T., Cambridge 39, Mass.

1902

Word has been received through Langdon Pearse '01 of the death of our classmate, Paul Hansen, which occurred February 6 after a brief illness. At the time of his death, Hansen was a member of the firm of Greeley and Hansen, Chicago, and in the practice of his profession had become recognized as one of the leading sanitary engineers of the country. As an engineer he had engaged in the design and construction of numerous water supply and sewerage works, including projects for New York City, Boston, Washington, D.C., Chicago, Buffalo, Toledo, Peoria, Ill., and Philadelphia. His broad experience and keen judgment were often called upon, and he served in many cases as an expert witness in rate valuation for water works. For the same reason he had been recently concerned in defense work for the War Department.

Hansen's engineering practice may be said to have started in the summer of 1901, when he served as a member of a survey party of the United States Geological Survey. In the following summer of 1902,

he was with the engineering department of the Massachusetts State Board of Health and returned to them in June 1903 upon his graduation. He remained there until May, 1904, when he became an assistant engineer on improved water and sewerage work at Columbus, Ohio, leaving that position to become chief engineer with the Pittsburgh Filter Manufacturing Company. He became associated in 1906 with the Ohio State Board of Health as first assistant engineer, later becoming chief engineer. He served as such until 1910, when he accepted the position of state sanitary engineer in Kentucky, where he remained until October, 1911. He then became associated with the state of Illinois as chief engineer of the state water survey and thereafter was with the state board of health. Some 19 months were spent in the service of his country as staff officer with General Pershing, on water supply. In 1920 he became a member of the firm of Greeley and Hansen and, as has been stated, achieved high honors in his profession. He held membership in many professional societies: American Society of Civil Engineers, Western Society of Engineers, American Society of Municipal Improvements, Boston Society of Civil Engineers, and the American and New England Water Works Associations. He was also a member of Sigma Xi and Theta Xi.

Hansen was in his 65th year at the time of his death, having been born at Arlington, Va., on August 9, 1879, the only son of John and Pauline Meyenberg Hansen. He married Alison May Scott in 1905, and they had two children: Elizabeth Scott (Mrs. Henry Pope, Jr.) and Dr. Paul Scott Hansen (S.B., Harvard '32 and M.D. Northwestern '37). His wife, children, and five grandchildren survive him.

Belated news has also been received of the deaths of three other classmates: William H. Horstman, IV, on April 24, 1943; George T. de Colmesnil, IV, on June 23; and Gardner Rogers, VI, on December 19.

Horstman had long been a resident of St. Louis, where he went in 1911 to take a position as architectural draftsman with the Missouri Pacific Railroad. Our class records contain no recent information. — De Colmesnil, at the time of his death, lived in Fairfax, Calif. He had been engaged in the architectural profession for many years, and was particularly active in the rebuilding of San Francisco. He took an interest in military affairs in his younger days, serving six years in the National Guard of California and one year in the Philippines in the Spanish-American War. Yachting was one of his hobbies. — Rogers, at the time of his death, was with the Philadelphia Securities and Exchange Commission as engineer and valuation expert. He resided in Merion, Pa. He became associated with Stone and Webster upon his graduation. He was stationed at Ponce, Puerto Rico, with the Ponce Railroad and Light Company, of which he became manager. Later he was superintendent of the Minneapolis General Electric Company; manager of the Houghton County Traction Company and the Houghton County Electric Light Company, Houghton, Mich.; and afterwards was with the Blackstone Valley Gas and Electric Company, Woonsocket, R.I.

Saylor has been appointed editor of the new *Journal* of the American Institute of Architects, which will be published monthly starting January this year and will replace the older publication, the *Octagon*. Saylor's new address will be 1741 New York Avenue, Northwest, Washington, D.C. — BURTON G. PHILBRICK, *Secretary*, 246 Stuart Street, Boston 16, Mass.

1903

We have received brief notices of the deaths of Andrew R. Cobb, IV, in Bedford, Nova Scotia, on June 2; of Wilfred A. Paine, IV, in Columbus, Ohio, on October 5; and of Virgil M. Palmer, II, in Rochester, N.Y., on February 16.

In addition, John W. Howard, I, died on January 25. Jack had been in ill-health, requiring several serious operations during the past several years, but it was a shock to us when he passed away. He had been at the Institute ever since he was graduated, as assistant in Civil Engineering from 1903 to 1905, instructor from 1905 to 1913, assistant professor of topographical engineering from 1913 to 1922, and associate professor of topographical engineering from then until his death. He leaves his wife, Alice W. Howard. George Greene and your Assistant Secretary represented the Class at his funeral at Forest Hills on January 28. His passing is a loss to the Class, and particularly to the civil engineers, who all knew and liked him.

Through Louis S. Cates '02, we hear that Frank D. Rathbun, civil and mining engineer at Las Vegas, Nev., is well and busy. — For the information of those outside the Boston area, we pass along the note that we decided to omit our usual midwinter dinner because of the February graduation and Alumni Banquet. But we should be glad to hear from members of the Class on the question of having a brief reunion, dinner, or outing early in the summer. Some classes plan an annual get-together, and as we get older, these affairs seem to be more desired. Let us know, so that plans may be made and notices sent out. — FREDERIC A. EUSTIS, *Secretary*, 131 State Street, Boston 9, Mass. JAMES A. CUSHMAN, *Assistant Secretary*, 441 Stuart Street, Boston 16, Mass.

1905

Al Prescott, II, says that his business (A. W. Banister Company of Cambridge, ordinarily blower and exhaust systems, dust collecting, and so on) is 100 per cent war work. He has two sons in very important war work and another who, after more than a year in the engineers' training work, is now studying engineering with a Star unit at Cincinnati. Al says his descriptive powers are inadequate to describe a granddaughter in Washington. He should take lessons from Andy Fisher. — Harry Donald, III, writes: "I am at the old stand, American Mutual Liability Insurance Company, daily from 8:45 to 5:30, and building rifle parts from 7:00 to 11:00 P.M. Available for appointments from 11:00 P.M. to 8:45 A.M." — Maurice Landers, II, has about the same stiff schedule. He works long hours at Ranger Aircraft, Farmingdale, Long Island, still keeping his connection with Hammond and Littell, patent attorneys in New York, and taking care of his own clients on nights and Sundays.

1905 Continued

Charlie Johnston, III, of Portsmouth, Va., tells us by letter that he was in Boston for quite a while last fall while Mrs. Johnston was recuperating from a serious but very successful operation. Charlie had a letter from Joe Daniels, III, in which Joe told of a surprise visit from his (Joe's) daughter, who had been with her husband in India, where he was in the service before being transferred to the States. This news apparently prompted Charlie to make the following suggestion: "Many of us must have sons or daughters who have moved to sections where some of the rest of us live. I bet there are some such right here. I should like to meet them and try to do something for them, but I know them not. Now if in the '05 class notes mention were made of these youngsters, maybe some of us would do something about meeting them. My daughter, Mrs. Edward G. Rawls, is living near Aberdeen, Md. Her husband is a lieutenant at the Chemical Warfare Depot, Edgewood Arsenal, Md." It's a good suggestion, and your Secretary would gladly co-operate in bringing hospitality to the sons and daughters of '05 men stranded away from home. That's something Class Secretaries are for.

Charlie enclosed a two-page letter from Roy Allen, III, now in Chuquimata, Chile. The letter gave a lot of detail as to his work and would prove mighty interesting to his friends, but our last Class President (apparently Roy's boss) told us a while ago that Roy was on an unheralded mission. So we'll just say that Roy has a big year's job on his hands, is accompanied by Mrs. Allen, doesn't like the earthquakes, or the Atacama Desert, or the driest soil on earth with an annual rainfall of only .01 inch per year, or the high prices of food and rent, and the scarcity of fruits, and so on. It must be a swell spot, and will Roy be glad when his year is completed?

Errett M. Graham, I, writes from his place of retirement, Shaw Island, state of Washington: "This little island is as little affected by the war as any place could well be. There are planes overhead from mainland stations daily, and heavy gun practice on the Olympic Peninsula is often heard. I have a son with the Douglas Company at Santa Monica, and a daughter at the Bremerton Navy Yard." — Fred Poole, VI, writes: "I have just turned 60 (aren't we all?) and am still hanging on. My daughter is driving a bakery truck while her husband is in the Army. With one hand I'm engineering maintenance of rolling stock for a large transit company and, with the other, manufacture of that important munition of war, chewing gum. The latter frequently gets stuck, disgustingly, on the former, requiring careful engineering for adequate separation into original components."

Hallet R. Robbins, I, has been transferred to Washington, D.C., where he has been assigned to the Office of Economic Warfare. Dow H. Nicholson, I, has been advanced to commander and assigned to the Public Works Department, Navy Yard, Philadelphia, Pa.

There are two deaths to report: Albert A. Roberts, with us a short while in Course VI, passed away on Feb. 2. A brief note from Captain Charles G. Barnd, United States Infantry, Fort Dix, N.J., informs us that his father, Jules V. Barnd, died sud-

denly and very unexpectedly at his home in Lima, Ohio, on January 15. — FRED W. GOLDTHWAIT, *Secretary*, 274 Franklin Street, Boston 10, Mass. SIDNEY T. STRICKLAND, *Assistant Secretary*, 71 Newbury Street, Boston 16, Mass.

1907

An Associated Press news item dated at Toronto, Canada, on December 13 stated that "Munitions Minister C. D. Howe, calling on Canadians to avoid postwar planning based on public works and the dole, announced a nine-point plan today for making Canadians 'the happiest people on God's green earth.' He advocated a higher standard of living, peacetime use of wartime inventions, a place in civil and international aviation, a merchant marine, mining industry expansion, reforestation, new markets abroad, a rebuilt home marketing and distribution system, and postwar plans built 'on the broad base of private industry, agriculture and our forests, mines, and fisheries.'"

Lieutenant Gardner S. Gould, Jr., in the United States Naval Reserve, son of our Tom Gould, became the father of a son born at Miami Beach, Fla., on February 3. It is nice to have another '07 grandson. — As of February 22, Henry Martin was with the price adjustment board of the Reconstruction Finance Corporation, with office at Room 324, 1129 Vermont Avenue, Northwest, Washington, D.C., and home at Apt. B-578, 39-41 Langley Court, McLean Gardens, Washington. — We have a new address for Colonel Harold S. Wilkins — 923 Florence Street, Aiken, S.C., and one for Stud Leavell — Colonel John H. Leavell, care of Diplomatic Pouch and Mail System, Department of State, Washington, D.C.

In the newspapers of Boston and eastern Massachusetts of February 21 was featured a story about the making of the 100,000th gun tube by the centrifugal process at the Watertown Arsenal in Watertown, Mass., on the preceding day. The roar when the hot metal was poured into the mold, together with an appropriate speaking program, was broadcast world wide by short-wave radio in connection with the "Army Hour" of February 20. In the Worcester, Mass., *Telegram* and some other papers was a picture showing John Mather, a colonel in the Ordnance Department, who is commanding officer at the Arsenal, taking part in the ceremonies. The following clipping is from the Washington, D.C., *Post* on February 20: — "Brig. Gen. Stuart C. Godfrey, air engineer of General Marshall's staff, has received the Legion of Merit for 'outstanding achievements,' including development of transportable steel landing mats, now in use in every theater of operations. General Godfrey, whose wife resides at 3703 33rd Place, Northwest, was decorated by Maj. Gen. George E. Stratemeyer, commander of All-American air forces in southeast Asia. He has been overseas for about four months after service here as chief of the operations and training section of the military division in the Office of the Chief of Engineers."

— BRYANT NICHOLS, *Secretary*, 23 Leland Road, Whitinsville, Mass. HAROLD S. WILKINSON, *Assistant Secretary*, Commonwealth Shoe and Leather Company, Whitman, Mass.

1909

In response to the statement in the February Review that the class officers had decided to by-pass the 35th reunion, two or three of our loyal classmates have remonstrated. It was pointed out that several professional engineering societies still continue to hold their conventions, even though they add to the transportation burden of the railroads. The Review Secretary, because of his connection with the American Institute of Electrical Engineers, is quite familiar with this situation and knows that the government encourages this type of meeting because engineers and other scientists are pooling their scientific knowledge and such knowledge is an important contribution to the war effort. To quote Paul: "I still feel that our reunions are diversions and not necessary. My own conviction is that such things as reunions, involving travel and hotel accommodations, are wrong right now." One good member feared that the omission of this reunion presages abandonment altogether of further reunions. He's dead wrong there. The class officers feel, as many classmates do, that as we grow older, reunions become more and more important. Be assured that they will be resumed just as soon as conditions permit. "Besides, I do not think the morale of the Class will suffer; we are not that kind of a Class — never were."

Speaking of the A.I.E.E., the Review Secretary, as is his annual custom, attended the winter convention in New York the week of January 23. Five of 1909's Course VI men were present, all taking active parts. Phil Chase and yours truly are both members of the Lamme Medal committee, which each year recommends an electrical engineer as a recipient of the Lamme Medal for having made some meritorious contribution to electrical engineering. Reg Jones is a member of the standards committee, under whose direction electrical engineering standards are sponsored. We both were at the meeting which was held Wednesday evening of that week. George Gray and Ed Howe were also in active attendance at the convention. Ed is on leave from Consolidated Edison and for the duration, at least, is with the Federal Power Commission.

In addition to meeting these four Course VI men, the Review Secretary had dinner with Paul on Friday evening, and '09 was our chief topic of conversation. Paul, however, told a most amusing anecdote concerning a native family of Isle au Haut, Maine, which will appear in subsequent class notes. Hence the convention proved to be a good reunion for several of us '09 men. During the week, the Navy arranged a special trip to the Brooklyn Navy Yard for those teachers who are instructing naval personnel in electrical engineering and radio. In addition, Captain H. G. Rickover, head of the electrical section in the Bureau of Ships, gave us two lectures on the use of electricity in the Navy. I can assure you that although the Nips have taken some terrible beatings in the Pacific, the worst is yet to be. — PAUL M. WISWALL, *Secretary*, 90 Hillside Avenue, Glen Ridge, N.J. CHESTER L. DAWES, *Review Secretary*, Pierce Hall, Harvard University, Cambridge 38, Mass. *Assistant Secretaries*: MAURICE R. SCHARFF, 3860 Rodman Street,

1909 Continued

Northwest, Washington 16, D.C.; GEORGE E. WALLIS, 1606 Hinman Avenue, Evans-ton, Ill.

1911

Congratulations to two new 1911 grandpas — our Class President, Don Stevens, II, and Mark Kinney, IV. Don sent me this terse announcement: "I am a grampa. Lois Cassandra Streett arrived January 27. Mother, child, and grandparents are doing well." Four days later, in Mount Vernon, Ohio, a bouncing 8-pound 14-ounce girl, Anne Curtis Fisher, was born to Betsey Bell Kinney Fisher (Smith and Mills colleges). The father, Lieutenant Richard B. Fisher, Yale '41, a navigator on a B-24, is attached to the Eighth Air Force in England.

Modest Mark Kinney is vice-president and general manager of the J. S. Ringwalt Company, Mount Vernon, Ohio. Miss Ethel Zolman, his secretary, thoughtfully enclosed an editorial from a recent issue of the Mount Vernon *News*, titled "Flowers for the Living." The writer was paying "a little tribute to M. C. Kinney for the fine work he has now done for the past year and more (as chairman of the Knox County USO) in organizing and conducting the soldier sendoffs for Knox county." Continuing, the editorial said: "He would be the last to claim he has done it alone, but at the same time it may be truthfully said the sendoffs could not have been conducted so successfully, if at all, without his leadership. The reason — he remembers well how much those small courtesies meant to him when he left for World War I. The result — hundreds of Knox county soldiers are going to remember Mr. Kinney as the last man they saw when they left for war." Mark, you may remember, was a pilot with the Royal Air Force and was wounded while flying over the German lines in France in 1918.

Major E. R. Hall, II, who says he is "still on a desk job in the War Department's F Building, Washington, D.C., but keeping in condition on the bare chance that I can be used where things are hotter," thoughtfully sent me a copy of a late January citation for a Distinguished Service Medal to Lieutenant General George C. Kenney, I, "for exceptionally meritorious and distinguished service to the government in a position of great responsibility from August 4, 1942, to September 1, 1943." "As commander of the Allied Air Forces," the citation continues, "General Kenney revitalized the air arm in the Southwest Pacific area. Initially his dynamic leadership made inadequate resources effective out of all proportion to their size and, as the force was built up, his constant bold extension of activity kept all elements of his command at a high pitch of aggressive effort. . . . During this period General Kenney wrested the command of the air from the enemy, thus creating in the Southwest Pacific area a situation favorable for large-scale coordinated offensive operations." Great work, George, and at this Washington's Birthday writing your accomplishments in and around Truk are marvelous.

Bill Warner, I, sent me a picture from the New York *Times*, of February 13, showing General MacArthur pinning the medal on George. From Nowata, Okla., Bill wrote:

"A good friend of mine, now a colonel stationed in the Fiji Islands, had quite a talk with Kenney when he was on his way to Washington recently. This young fellow gave me a very interesting report of the conversation. George certainly is doing his job well, for which we can all be very thankful. Nothing new to report from here. One son was in Africa at last report and the other has completed his basic training in field maneuvers and will no doubt be taking a trip soon." — My own younger son (19) was graduated from the ground school at the naval air technical training school, Memphis, Tenn., in mid-February and earned himself a rating: George W. Denison, A.M.M.1C (aviation machinist's mate, first class).

The Class is honored by the recent appointment of Gus Frigon, VI, manager of the Canadian Broadcasting Corporation, as M.I.T. honorary secretary for Montreal for a five-year term to expire in 1949. Other '11 men now serving as honorary secretaries include L. P. Ferris, VI, Montclair, N. J.; Don Southgate, IV, Nashville, Tenn., who is also president of the local Technology Club there; George Forristall, II, Houston, Texas, also President of the Technology Club of Southern Texas; and Don Frazier, II, Richmond, Va., President of the Technology Club of Virginia.

Continuing her skating activities, Dorothy Glazier, daughter of Gordon Glazier, VII, was third in the recent women's senior eastern sectional figure skating championships at Lake Placid, N.Y. — In a recent issue of *Bestoval News*, house organ of the H. A. Johnson Company, Boston hotel equipment and food purveyors, appeared this paragraph in President E. C. Johnson's personal notes: "A good friend, Dr. Carl S. Ell, is President of Northeastern University. Recently the girls in the offices there formed a little group — someone suggested naming them Ell's Belles." — Dick Gould, XI, and Ted Parker, I, attended the Technology Club of New York luncheon during the annual winter meeting of the American Society of Civil Engineers.

A quartet of address changes to close: James R. Carpenter, I, 528 Northeast 62d Street, Miami 38, Fla.; Herbert Fryer, VI, R.F.D., Carnation, Wash.; Morell Mackenzie, II, 104 Irving Avenue, Providence, R.I., "back home" after a number of years in Dallas, Texas; Roland S. Simonds, IV, 727 Maple Street, Manchester, N.H. — Please don't forget to send in news of Junior Eleveners in the armed services. — ORVILLE B. DENISON, *Secretary*, 82 Elm Street, Worcester 2, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford 55, Mass.

1912

H. H. Brackett, VI, was good enough to write and say that he is still in telephone engineering, with the New Jersey Bell Telephone Company at Newark, his specialty being the most effective use of toll lines. He is living at 515 Summit Avenue, Oradell, N.J., with his sister and niece, and would like to hear from any of the Class, either at his business or home address. Looking ahead to after the war, Brackett says he will be at our next reunion — which we all hope will be soon.

Sy Symonds writes that he is extremely busy on government work in fitting out

deck auxiliaries for the Navy. His title is president and treasurer of the New England Trawler Equipment Company, 305 Eastern Avenue, Chelsea, Mass. His eldest son, Curtis, a pilot of a B-24 Liberator, is serving in the Seventh Air Force in the central Pacific, while his second son, William '46, left M.I.T. over a year ago to enter the Air Forces and will soon complete his training. Sy now boasts of being a grandfather, through the thoughtfulness of his daughter Barbara. Sy lives at Marblehead — and the latchstring is always out.

Your Secretary greatly enjoyed having lunch with Henry A. Babcock in Los Angeles in February. Bab is chief of the division of man-power utilization, War Manpower Commission, covering the southern part of California. The eldest of his five daughters has been a WAC for some time, and the other four are still at home. Your Secretary enjoyed a very interesting and instructive trip to San Francisco and Los Angeles, and found that the West Coast has outstripped the East in the stepping up of wartime production. — Elliot W. Tarr, on his return from Scotland, went with Stone and Webster and is now located at 2929 Woodbine Avenue, Knoxville, Tenn. We are writing for more details, to be reported later. — FREDERICK J. SHEPARD, JR., *Secretary*, 125 Walnut Street, Watertown 72, Mass.

1913

We regret to report the passing of Miles E. Langley, I, and Benjamin White, I. Miles died at Portland, Maine, on January 19 of pneumonia, following an illness of three months with undulant fever. Mrs. Langley said that all during that period he was helpless but unfailingly cheerful. He leaves Mrs. Langley; a son, Theodore, four; and a daughter, Patricia, eight. Miles was the outstanding scholar in Course I. He had everything it takes to succeed, and he did succeed. After a few years of teaching at Bowdoin College, he entered the packing business and was vice-president of the Portland Packing Company. At our 25th reunion he told us many interesting side lights on the business of canning foods. Miles was devoted to his family and passed up advancement in his business in favor of the joys of family life in a small New England seaport city.

I have the following nice letter from Ben White's daughter, Helen, at Brunswick, Ga.: "Mother and I appreciate your kind letter of sympathy and also your interest in my father. His passing was a shock to us all. He enjoyed perfect health until the Sunday (June 13) when he was stricken with a cerebral hemorrhage that proved fatal. Although Dad had traveled much, he was at home at the time. He awoke that morning feeling fine, did some gardening, and feeling this thing coming on went upstairs, lay down in bed, and a few minutes later lapsed into a coma. He passed away later that afternoon without regaining consciousness. . . . The White Construction Company is still active and will be continued by my brother, Norman, after the war. He also was graduated from M.I.T. Course XVII, Building Construction, in 1936 and is at present on foreign duty, a captain in the combat engineers. . . . Ben had a hard row to hoe, but he hoed it. He started in building construction, stuck

1913 Continued

to it through all kinds of adversity, and finally reaped a substantial reward.

Arthur Townsend, II, has been appointed acting director of the Lowell Institute School at M.I.T. This is an achievement. — Ken Hamilton, II, writes: "Some day I'll write my history, but I can't do it now. I eat regular, sleep good, work hard, and my income tax is paid. I play golf, I bowl, and the other day I went skating. Haven't seen any of the boys for some time. Will make the next reunion sure." — Howard Currier, II, sent a nice note with his check: "I have been keeping very busy since war started, still with General Motors at Oldsmobile. Our engineering work has been entirely concerned with design, development, and building of experimental automatic cannon and related mechanisms — quite far removed from the postwar automobile to which we are all looking forward. But actual winning of the war must be more clearly in sight before much attention can be given to that sort of thing."

Allison P. Smith, VI, writes: "It's been a long time since I have seen or heard from the '13 gang. My last eight years have passed like a dream or a nightmare. I've seen the depths of depression and yet have tried to enjoy life to the utmost. Three of my six boys are all through college, and a fourth finishes in June. (One of them is studying to be an Army surgeon.) My fifth has recently become 18 and has just passed his exams for the Army Air Forces. The last one is running the farm — attending to all the chores while I am here in Worcester back working at a trade, that of mill maintenance carpenter. I go home to Stow on week ends during the winter and commute the other eight months. If the gang get together this spring or in June or at any other time in warm weather, I should appreciate your dropping me a card. I'll get there if it is possible. Your address on the envelope sends a thrill through me, for my memory goes back to childhood in Pawtucket, where I was brought up. In fact, I went through three years of high school there, and last year I went back for the funeral of my sister, Mrs. Carleton Bryant.

... I guess I'm like a good many others — I dream of the old gang and imagine them just as I last knew them. I hear indirectly from some and know that some have weathered the years and come out on top, and that a few have passed on, but it will be fun sometime to get together with you folk and be able to ask 'Well, what has become of Brewster, B. L. Pierce, Hap Peck, Bill Mattson, and Butzy?' — FREDERICK D. MURDOCK, *Secretary*, Murdock Webbing Company, Box 784, Pawtucket, R.I.

1914

Here are the dates: May 27 and 28 at the Westchester Country Club, Rye, N.Y. If you have not received an announcement by mail, write for one from any of your class officers. There will be no large reunion committee or any drive to urge a large attendance. War conditions will dictate what any Fourteener can do. The location has been selected for easy accessibility to New York, the area where the greatest number of active classmates reside. It is sufficiently near Philadelphia, Washington, Boston, and other eastern cities so that Pullman reservations are not necessary. The uncertainty of the length of the war made it in-

advisable to postpone the reunion for a year. Let us make this 30-year reunion a genuine get-together.

Don Douglas just does not stay out of the news. Hardly a day passes that does not find some news item about his war activities. Now comes a personal item, and even that takes on a national aspect. The engagement of Don's only daughter, Barbara, to William B. Arnold, second son of General H. H. Arnold, chief of the Army Air Forces, has just been announced. Lieutenant Arnold was graduated from West Point last June, and Don's daughter from the University of Southern California. This joining of the families of the chief of our Air Forces and the greatest manufacturer of aircraft in this country should be bad news to Hitler and Tojo.

Bill McPherrin has written to Charlie Fiske that he is rapidly getting his strength back again after spending a large part of December in a Kansas City hospital, where he had his gall bladder removed. — Henry R. Aldrich has been appointed a member of the committee on geological personnel of the National Research Council, in the division of geology and geography. This new committee will survey, plan, and co-ordinate activities in personnel matters of the various societies, institutes, foundations, and other agencies in the field of geology.

It is hoped that by the time these notes reach you, 1914 will have gone over the top in the Alumni Fund. As these notes are being written, we are only three persons and just under \$200 short of our quota. Hats off to Ross Dickson, who is responsible for this accomplishment. If you are not on the list or could help on that \$200 boost, Ross would indeed like to hear from you.

Your Secretary attended the annual convention of the American Institute of Electrical Engineers the last week in January in New York and was delighted to see C. W. Ricker, who had come up from New Orleans. Herman Affel was chairman of one of the sessions which dealt with communications. — H. B. RICHMOND, *Secretary*, General Radio Company, 30 State Street, Cambridge 39, Mass. CHARLES P. FISKE, *Assistant Secretary*, 1775 Broadway, New York, 19, N.Y.

1915

Our Alumni Fund final total is \$2,981.50 from 150 men. That's 101 per cent of our dollar quota. Nice going, many thanks, and do the same or better for this year's Fund, which begins in April! One hundred and twenty men have paid class dues. Still a few of the old reliable stand-bys haven't sent in their checks, and if you are one of them, how about it? For the information of classmates paying their dues from all over the country, the "extras" for the Boston and New York class dinners cost the class treasury nothing. The "extras" were supplied by generous classmates.

For the first time since Pearl Harbor we have had class dinners, and some sort of history must have been established when by virtue of Henry Sheils's membership in the Boston Harvard Club we held a dinner there on February 4. Probably never before has the Harvard Club been so honored by a Technology Class. Nor have the walls of the cloistered and dignified clubhouse resounded with Yale's *Boola-Boola* as rendered loudly if not too well by Little Andy.

Thirty-five classmates and two guests, Albert H. Wechsler '21 and Felix J. Conti '34, made a record attendance. The enjoyable dinner and pleasant social evening were enlivened by a gay and exciting discussion of the Celtic origin of the Rooney name and clan. Here they are: C. W. Howlett, Henry C. Sheils, John N. Dalton, F. J. Conti, Harry J. Murphy, Max Woythaler, P. J. Munn, F. E. Waters, L. J. Heath, Ed Sullivan, Horatio W. Lamson, Frank J. Herlihy, Loring Hayward, Carl Wood, Louis Young, Frank Scully, Marshall Dalton, O. R. Freeman, Bert Adams, Roland Baldrey, Wally Pike, Whit Brown, A. E. Sampson, Ralph Joslyn, Sam S. Eisenberg, Arch Morrison, Frank Murphy, Harold L. Colby, George Moulton, Larry Landers, Abe Hamburg, Jac Sindler, Albert H. Wechsler, William H. Brackett, and Azel W. Mack. Long-distance honorable mention went to Little Andy from Providence, John Dalton from Lawrence, Al Sampson from Beverly, Max Woythaler from Framingham, Fred Waters from Newburyport, and Loring Hayward from Taunton.

Anyone who feels that in any way the separation of distance and contact with the New York and Philadelphia class groups detracts from their loyalty, spirit, and camaraderie should have seen our New York dinner on February 18. With most public places gone to war, Ralph Hart offered the use of his apartment and called in a caterer who gave us a splendid dinner. Beginning with cocktails at eight, it was a most successful evening. Herb Anderson, Ed Whiting, and Sol Schneider came up from Philadelphia. Henry Daley, who had worked arranging the dinner, was unavoidably detained at the last minute. Those of us who came down from Boston were well repaid. Here they are: Bob Mitchell, Kebe Toabe, Dooch Fulton, Howard King, Charles W. Williams, Bartlett Pinkham, Henry Sheils, Stan Willis, G. H. Warfield, Larry Landers, Ed Sullivan, Chauncey Durkee, Sol Schneider, Ralph Hart, Alan Dana, Christian Wolfe, Ed Whiting, Louis Young, H. W. Anderson, Samuel Berkowitz, W. A. Swain, Azel W. Mack, Hank Marion, Louis H. Zepfler, Ray Walcott, Samuel Hart, and Max Woythaler.

George Rooney had planned to be there but could not make it because of a last-minute illness. Jerry Coldwell wanted to go but was in DeKalb, Ill., and Ernie Loveland was too far away at Tuscaloosa, Ala. Clif Sifton has two sons in the Air Forces, and one was at home that night on unexpected leave. Everett R. Brigham was in Mobile, Ala., on war work with the Navy. Boots Malone was in Vermont. Clive Lacy is now a lieutenant colonel in Chemical Warfare, stationed at Gravelly Point, Va., and says he has been there in the field requirements division since last July. Ken King planned to come up from Wilmington, but he had just returned from a month's trip to the Pacific Coast and had to attend a union meeting that night. Herb Anderson, President and General Manager for Fidelity Machine Company, Philadelphia, has just been elected a director of the Second National Bank there. He's vice-president and director of the Northeast Philadelphia Chamber of Commerce and is connected with many technical and welfare associations. Otto Hilbert sent his dues check in one of the old twenty-fifth reunion letter-

1915 Continued

heads and said, "Our thirtieth is not too far off and I hope the war does not prevent it." That seemed to be the feeling of the men at both the Boston and New York class dinners — so let's look forward to it.

At the luncheon sponsored by the Technology Club of New York on January 20, in connection with the annual meeting of the American Society of Civil Engineers, G. Harold Warfield and M. Warren Cowles of our Class were there. — At the annual Alumni Stein-on-the-Table Dinner at the Hotel Statler, Boston, February 26, were the following: Marshall Dalton, Alfred Hall, Whit Brown, Speed Swift, Fannie Freeman, Wally Pike, Vincent Maconi (who came up from New Haven to see his son graduated), Arch Morrison, Larry Landers, and the Class Secretary.

A new member of the Grandfathers' Group is Ben Neal of Lockport, N.Y. On the sixth of January, at Winchester, Mass., his daughter Barbara presented him with a grandson, James Neal Dearman.

Send your Alumni Fund check and your class dues now! — AZEL W. MACK, *Secretary*, 40 St. Paul Street, Brookline 46, Mass.

1916

Freeman Clarkson writes that he is relaxing and regaining his health at Newfane, Vt. Recently he has been with the Putney School Inn but is now getting out lumber at South Wardsboro. Any classmates going to Vermont should be on the lookout for Freeman. — Bill Farthing, our illustrious Class President, is still on the job in New York City at 33 Liberty Street. He is assistant manager of the New York loan agency of the Reconstruction Finance Corporation and agent of its numerous subsidiaries, such as the Defense Plant and Defense Supplies corporations and the Rubber Reserve Company, which have been created to further the war activities.

He writes: "During a recent trip to Washington, I had lunch with Commander Dave Patten and Lieutenant Commander Hen Shepard. Dave could have talked but didn't. I did learn, however, that he was in the Aleutians during the Battle of Kiska and that in September he convoyed a Truman subcommittee to the Aleutians and to Alaska. He is a member of several important Navy staff committees and has numerous high-sounding titles that were too complicated for me to remember. Shep reported that since his last letter to you he had been transferred to the Pan-American division of the Office of the Chief of Naval Operations and is located in Washington for the time being. Shep is right at home, for in the last war he was naval aviation ordnance officer, operating out of Washington. I also ran into Bob Wilson in Washington. He spends a great deal of his time there as a member of the Petroleum Industry War Council and is chairman of its petroleum economics committee."

Hovey T. Freeman, custodian of our large and bursting class treasury, breaks into print again. He writes: "I have been elected to the presidency of the Providence Governmental Research Bureau, which devotes itself to the investigation of and recommendation for improvements in our local city and state governments. Our association works quietly and in a co-operative manner with the elected officials and by pointing the way we really feel that we

have accomplished a great deal. I have had at least two opportunities to go into the service on a commission basis as lieutenant colonel, but I have felt that I could do more for the country by continuing in my present job in preventing fires at the larger industrial plants of this country. I am well represented in the Navy, as I have two youngsters in it: My oldest son and oldest daughter are both naval officers, the first stationed at the naval dry docks at Long Beach, Calif., and the other at the naval air station at Pensacola, Fla."

Joseph Barker, our representative in the Office of the Secretary of the Navy, is still holding down his job as dean of engineering at Columbia University as well as being special assistant to the Secretary of the Navy and chief of the division of training, liaison, and co-ordination. He writes: "It has been my duty to work on the policies which established the personnel and training programs of the Navy relating to both naval and civilian personnel. Since its establishment, I have also been the Navy alternate on the War Manpower Commission. During this period I have been on part-time leave of absence from Columbia, returning to the university as frequently as my duties would permit to carry on the general policies of the school of engineering. The associate dean has carried on all the heavy work and has borne the burden during these difficult times for all engineering schools.

"Last June my engagement to Mary Casey Mallon of Washington was announced and on December 11 we were married in her home, with members of our family present. Following the ceremony, a reception was held at the Mayflower Hotel at which many classmates now in Washington were present. We have established a 'duration residence' at 3928 McKinley Street, Northwest, Washington 15, D.C., but plan to return to my New York City home as soon as war conditions permit.

"My daughter was graduated from Barnard College last June. Having majored in mathematics and physics, she is now in the engineer of manufacture department of the Western Electric Company at their vacuum tube works in New York City. My son is with us in Washington and will be graduated this June from the St. Albans School for boys. Since he will be 18 in May, he will be in the armed forces shortly after graduation."

Dave Patten writes of seeing Charlie Woolley, XI, who is a lieutenant colonel in the Army Air Forces, located in Washington. Dave also says that the new Mrs. Joe Barker is "a lawyer of no small fame herself, and is most attractive." (Perhaps we should invite wives to our 30th reunion at the Oyster Harbors Club in 1946.)

As I write these class notes, our 1916 aircraft executive, Charles J. McCarthy, is out in Palm Springs, Calif., helping his attractive wife recuperate from a recent operation. He was expected back in Hartford by the middle of March. — JAMES A. BURBANK, *Secretary*, Travelers Insurance Company, Hartford, Conn. STEVEN R. BERKE, *Associate Secretary*, Berke Moore Company, Inc., 11 Boylston Street, Brookline 46, Mass.

1917

Ray Blanchard was recently elected a director of the Norfolk and Dedham Mutual

Fire Insurance Company of Dedham. He is also a director, vice-president, and general manager of the Hood Rubber Company of Watertown, management member of the Greater Boston War Manpower Commission, and a director of the First National Bank in Malden and of the Arrow Mutual Liability Insurance Company of Newton.

Stanley L. Chisholm, formerly laboratory officer at the San Diego Naval Air Station and now a lieutenant commander on duty in the Bureau of Aeronautics in Washington, has recently been cited by the Secretary of the Navy for conspicuous service in the conception and development of a method for the improved control of the anodic process applied to aluminum alloys used in the construction of naval aircraft. His citation reads in part: "You have contributed essentially to enhance mechanical and anticorrosive protection of a vital war material and have insured chromic acid coatings of controlled thickness and uniform characteristics, as well as maximum output for man- and equipment-hours spent."

Rudy Beaver reports that Jimmy Doon, formerly of Henniker, N.H., and of the New Hampshire Public Service Commission, is now a major in the provost marshal generals' school at Fort Custer, Mich., where he has been since early in the year.

The following account from the New York Times of January 30 will be of interest to the Class: "'Beach-head' Harrington, properly, Major Walter Harrington of Scarsdale, N.Y., used to do his traveling on a commuter's ticket, but that was before he was assigned to the Seventh Air Force, where in 286 hours of flying in combat areas he has seen enough of the Pacific war to satisfy most people. The title 'Beachhead' is supposed to refer to his activities as advance man for the Seventh Air Force on successive island bases in the Pacific. He was aboard the first Army plane that landed at Tarawa, now an advance base for operations in the Marshalls. Earlier he was at Guadalcanal and with Australian front line troops at Nassau Bay. In September he flew as observer and waist gunner with heavy bombers of the Fifth Air Force in attacks on Salamaua from Australian bases." It is reported that Mrs. Harrington is living in Scarsdale and that Walt's son is serving in the infantry in Hawaii.

In December, Tom O'Brien's father sent Ray an account of Tom's career in the Navy and a copy of a letter from the President to Mr. O'Brien. With the belief that these will be of interest to all who knew Tom during his days at the Institute, they are given herewith: "Captain Thomas Francis O'Brien, graduate of M.I.T., 1917, in Naval Architecture, entered the naval service in 1917. Records of the Navy Department give him very high rating in submarine construction and salvage work during his more than 25 years of service. He was the first man in the world to land on a submarine in a diving bell and take several persons to the surface. At this time he and Commander Morsen were testing types of diving bells, out of which experiments came the bell used so effectively in rescue operations from the *Squalus* at Portsmouth, N.H., in 1939. He was ordered to the Philippines in January, 1941, and assigned to the staff of Admiral Hart, serving as supervisor of construction and repair for the squadron. When

1917 Continued

the Navy got away from Bataan and Corregidor, Captain O'Brien got as far as Cebu, where he was directing submarine and P boat operations until Cebu surrendered on April 10, 1942, from which time he was not heard from until August, 1943, when he was reported a prisoner of the Japanese at Osaka, Japan. In September news was received that he had died in the Osaka prison camp in December, 1942. He received posthumous promotion to captain, effective September 5, 1942, at which time he would have been promoted were it not that he was then officially missing."

The letter from the President to Mr. O'Brien, dated last October 18 and written from the White House, read as follows: "Dear Bill: My heart goes out to you in the sorrow which has overtaken you with such crushing force in the death of your gallant son, Commander Thomas Francis O'Brien. You must be consoled by the thought that he faced death bravely in his country's service. Please accept for yourself and for all who mourn with you this assurance of deepest sympathy, in which Mrs. Roosevelt joins. Very sincerely yours, Franklin D. Roosevelt."

Clark Robinson was killed in a plane crash on the Burma border on December 12. An Army major, Clark had been art director of the Radio City Music Hall and of the Roxy Theater. He was also the decorator of the Wedgwood Room of the Waldorf, the Copacabana, and the Music Hall stage, as well as the designer for Billy Rose's Aquacade and the Music Box revues. He had been serving in the Army as a recreational officer in India. He is survived by his wife, Ethel Babcock Robinson, and by three daughters.

A brief note has come in from Ras Senter indicating that he is hard at work, as usual. He reports that the time has come when every officer and stockholder has got to get out and go to work on his properties if he wants to save them. Suing the deed to the thought, Ras has recently been working on his leases in Louisiana with time out for the Christmas holidays at home. — Your Secretary left Boston in mid-February for a business trip of several weeks' duration to Puerto Rico. Ray's older son is at the midshipman's school of the Naval Reserve in New York, and his younger son is one of the five V-12 students from the Institute, and one of 15 from the country at large, selected as of March 1 for specialized training in physics at Columbia University.

Lest there be a raised eyebrow at the inclusion of the foregoing item, your Assistant Secretary wishes to say that after a long period of inactivity in connection with these notes, he has once again come to bat; at the same time he wishes to make a grateful gesture of thanks to Ted Bernard and others who have on numerous occasions pinch-hit for him. — RAYMOND STEVENS, Secretary, 30 Memorial Drive, Cambridge 42, Mass. PHILIP E. HULBURD, Assistant Secretary, Phillips Exeter Academy, Exeter, N.H.

1919

The time these notes are written precedes the graduation exercises of the February Class of 1944 in which, as a 25-year reunion Class, 1919 participated. On Saturday afternoon, February 26, the 25-year talk to the graduating class was presented by your

Secretary at Class Day exercises. The Alumni Banquet in the evening was well attended by the Class. Donald D. Way, our President, sat at the speakers' table, in order to present our 25-year gift to the Institute. Those who had made advance reservations for the 1919 tables included J. Herbert Gould, Clarence L. Nutting, Elliot D. May, Leighton B. Smith, Wayland S. Bailey, George Michaelson, Chester C. Stewart, Rogers B. Johnson, James Holt, Eugene Mirabelli, Warren Maynard, Isidor Slotnik, Scott Keith, Donald Kitchin, Joseph S. Newell, Arklay S. Richards, Carl L. Svenson, Bob Hackett, Bill Banks, George W. McCreery, Marshall C. Balfour, H. Stanley Weymouth, B. H. Bristol, Royden L. Burbank, Waldo B. Clark, Horace W. Denison, Arthur C. Kenison, Max Knobel, Marshall B. Lee, Harry H. Mardoian, Karl L. Nutter, Hyman P. Selya, Frederick C. Spooner, George H. Wiswall, Jr., and E. R. Smoley. On Monday, February 28, at the commencement exercises, your President and Secretary donned cap and gown and paraded as the 25-year representatives.

The last-minute returns of pledges for bonds for our gift have been excellent. We shall continue collecting these bonds up to and during our 25-year reunion on July 28, 29, and 30. A note from Alexis R. Wiren states that he has been active in the bond drive among Technology Club members in New York and has succeeded in getting 67 bonds, or a total of over \$33,000. The "Class 1919 — 25 Years After" book is in the making; the committee which has been working on it follows: Donald D. Way, Marshall C. Balfour, Alan G. Richards, Royden L. Burbank, Fred Given, Dave Sanford, Chuck Drew, Timothy E. Shea, Karl F. Rodgers, Bernard S. Coleman, Leo A. Kelley, and E. R. Smoley. We urge the Class to back the committee at present by mailing in their questionnaires and photographs if they have not done so up to the present time. They have been coming in, but we need a great many more. — The present address of Israel P. Maizlish would be appreciated if anyone in the Class knows of his whereabouts.

Timothy E. Shea, 245 Springfield Avenue, Rutherford, N.J., was in the office recently and submitted all of his reunion material. I quote from his letter: "I have not encountered you for some time on airplanes or at railroad terminals, and so I am sending you a few paragraphs. For about three years now, I have been intensively engaged in research and development work under the auspices of the National Defense Research Committee. During that period, I have been director of research, in the division of war research at Columbia University; I am also on leave of absence as chief engineer of the electrical research products division of the Western Electric Company. There is a laboratory at New London, Conn., of which I have general charge, and various other activities have at one time or another been under my supervision. Details are not in order at this time.

"No doubt the general environment of such work is not unlike that which surrounds the work of many classmates these days. It is a composite of long hours, attention to multitudinous details and varied and rapidly shifting problems, stress due to time elements, liaison activities with a large number of people, limitations im-

posed by the conflict and balancing of many wartime factors, with extensive travel to maintain relationships, and in between, as circumstances permit, enjoyable visits with the family. Since I saw you last, I have journeyed twice outside the country. A number of Technology men have been associated with me, particularly Warren Horton '14 and Jack Kennard '18. I have enjoyed my relationships with them and with the other technical men who have been brought together in our activities; I am very much impressed by the devotion with which they make their abilities and efforts productive for the nation.

"My oldest son, Paul, who completed two years at the Institute in the Class of 1945, is undergoing specialized training in the Army at Texas Tech. The second son, Bob, is in the Army at Camp Roberts, Calif. Tim, the third son, is finishing preparatory school, where he is especially interested in basketball and hopes to get into the Navy this year. These boys, by the way, are big fellows — 6 feet, 6 feet 2, and 6 feet 4 in height. We have six children in our family; in addition to the three boys mentioned above, two younger boys and a girl, Thomas, John, and Patricia, are in various stages of schooling. You can well see that Mrs. Shea, as 'keeper of the castle,' has her hands full. We men would not be able to engage ourselves so fully in war activities were it not for the support we get from the womenfolk."

I have heard from Francis A. Weiskittel in regard to his activities with Laurence M. Dalton and Daniel C. Hall in behalf of the class reunion. Francis is a captain in the Chemical Warfare Service located at 200 West Baltimore Street, Baltimore 1, Md. He concludes his letter, "with best wishes for your success in guiding the Class to a memorable 25th reunion." — Al Richards has taken over the assignment of assistant secretary of our Class and will be able to increase our Boston news items. Al expresses his regret at not being able to attend the activities on February 26, when he was out of town.

The New York *Herald Tribune* carried an announcement on December 12 of the marriage of Leighton B. Smith, X, to M. Adelaide Murray. They were married at her home in Flushing, Queens. — S. Albert Kaufman, Box 50 AAA, Rural Route 1, North Wilmington, Mass., sends the following notes: "We have built a small home with the hope of adding thereto when building restrictions are lifted. It is on a beautiful eight-acre piece with an attractive pine grove, a frontage of a quarter of a mile on the Shawsheen River, and a rustic bridge to enhance the water that flowed all winter without freezing, because of the rapid current at that spot."

Your Secretary wishes to thank Evelyn Kitchin, who wrote a very interesting letter about Don and their children. They live at 50 Hastings Street, Wellesley Hills, Mass. Don is with Simplex Wire and Cable Company, doing research. Don, Jr., is in the Navy. Bob, who has been all over the country — Chapel Hill, Dallas, and Pensacola — got his wings on February 15 and will get special training in navigation. Charles is still a private, first class, at Camp Shelly.

Malcolm R. McKinley, at present general superintendent of the electric department

1919 Continued

of Tampa Electric Company, Post-office Box 111, Tampa 1, Fla., expects to be at the 25-year reunion. — Harold F. Marshall, a major in the Air Forces, says: "I have been at Wright Field for almost two years now in the production division of the matériel command. The place is full of Technology men." — Edward A. Richardson wrote from Bethlehem, Pa., where he is with the Bethlehem Steel Company. — John W. Meader, Room 2W19, Navy Department, Washington, D.C., writes: "I am sorry we have to rely on chance meetings for exchange of news. I have been working for the Navy in the Bureau of Aeronautics since October, 1941. I am now on design production work, traveling most of the time."

The following changes of address have been received: Louis A. Brown, Jr., from Pasadena, Calif., to 545 South Figueroa Street, Los Angeles 13, Calif.; Willis C. Brown, from Arlington, Mass., to 261 Hawaii Avenue, Northeast, Washington 11, D.C.; James H. Butler, Jr., a lieutenant in the Air Forces, is now located at 1300 South 4th Street, Monroe, La. — Francis J. Coyne lives at 228 Greenlodge Street, Dedham, Mass.; Edward F. Deacon, at 546 5th Avenue South, Clinton, Iowa. — Herman A. Herzog may be addressed in care of Alfred Jacobshagen Company, 4419 South Ashland Avenue, Chicago; Freeman H. Horton, at Box 958, Bradenton, Fla. — Mrs. Raymond Newcomb resides at 107 Atwood Avenue, Newtonville 60, Mass.; Francis D. Porcher, at 1817 East 50th Street, Seattle, Wash. — Philip L. Rhodes is located at 11 Broadway, New York, N.Y. — Commander Edward E. Saunders is with the United States Navy, Room 2231, Navy Building, Washington, D.C.

Leo A. Kelley, 3438 87th Street, Jackson Heights, N.Y., is a consulting engineer specializing in communications and electronics. He has been patent-experting since 1935. He conducted a colloquium at the Institute in 1932 on the subject of electric wave filters, has presented papers, and has written technical articles relating to the art of communications. He told me the other day that in one of the meetings with the firm of Charles W. Hill during a patent case in Chicago, he had sat alongside a familiar individual who turned out to be B. H. Sherman.

Freddy Given sent me a copy of a letter from Mrs. Morrison announcing the death of Colonel Robert Fletcher Morrison, II, on October 16, while in active service. She resides at 30 Heathcote Road, Scarsdale, N.Y. Morrison was vice-president of the Hastings Pavement Company, Hastings-on-Hudson, N.Y., prior to his war service.

Ev Doten, now with Jefferson Engineering and Manufacturing Company, 269 Walker Street, Detroit 7, Mich., writes: "Old man Doten is not quite dead — but I guess you have been thinking there is not much hope." Ev will be in New York in the very near future, and we should have some information from him at that time. — Daniel C. Hall, who is superintendent of lithopone at the Chemical and Pigment Company, Dundalk Post Office, Baltimore, Md., has been exceedingly busy and wishes us the best of luck in the 25-year reunion campaign, which he has been assisting.

Robert R. Litehiser is a lieutenant colonel on the staff and faculty, Command and General Staff School, Fort Leavenworth,

Kansas. — Holley S. Winkfield is district manager of the Master Electric Company, 716 Columbus Avenue, Boston, Mass. — Ralph A. Cartwright, 80 Maiden Lane, New York 7, N.Y., is with Frenkel and Company, Inc. — Eaton Webber, 748 Wattertown Street, Newtonville, Mass., writes: "Sorry to be away on the 26th, but I'll suspend business for the reunion the latter part of July."

Henry L. Cassidy, 86 Hillside Terrace, Irvington-on-Hudson, N.Y., has concentrated on economic research with the Allied Chemical and Dye Corporation of New York City for the last 10 years. — Warren A. Maynard has been a telephone engineer in the traffic department. He has been active in Boy Scout work, in town finance committee work, and church work. He resides at 57 Oxford Street, Winchester, Mass.

George McCreery is a partner in McCreery and Theriault. They conduct engineering design and construction of all types of buildings throughout the Boston territory. George is a present member of the Visiting Committee on the Building Engineering and Construction Course at the Institute, present member of the Alumni Council, class agent for 1919, and was secretary of the Boston Community Fund 1941. Bill Banks is now assistant class agent.

Eugene Mirabelli, Associate Professor of Structural Design at the Institute, with home address of 1963 Massachusetts Avenue, Lexington, Mass., has been connected with several engineering projects dealing with structural designs, investigations, and reports on bridges, buildings, airplane frames, and other structures. — Joseph S. Newell, Post-office Box 123, Lincoln, Mass., is professor of aeronautical structural engineering at the Institute. He is co-author of *Airplane Structures*, a text which is standard in the field. — EUGENE R. SMOLEY, Secretary, The Lummus Company, 420 Lexington Avenue, New York 17, N.Y. — ALAN G. RICHARDS, Assistant Secretary, Dewey and Almy Chemical Company, 62 Whittemore Avenue, Cambridge 40, Mass.

1920

More news of military prowess and advancement! Louis Bender is now a colonel; his present address is 1601 Boswell Avenue, Topeka, Kansas. Ellsworth Brown is a lieutenant commander and is with the industrial department, United States Navy Yard, Philadelphia. Bill Nelson is a captain and is living at 5630 Canal Boulevard, New Orleans. Sam Rubin has been promoted to lieutenant colonel and has a San Francisco A.P.O. address. Major Al Wason is assistant director of the supply and service division, Camp Phillips, Kansas. Leland Gilliatt, a lieutenant colonel, has a New York A.P.O. address. Colonel Walter Warner is using 136 South Hamilton Street, Poughkeepsie, N.Y., for his address. Joe Gelders is a technical sergeant; address, 707 Sixth Street, Davis, Calif.

It is a pleasure to announce the engagement of Nell Carpenter's son, F. Scott Carpenter, Jr., to Barbara Condit of Egypt, Mass. Young Mr. Carpenter is one of the sons of 1920 men who followed in their father's footsteps, being a member of the Class of 1944. — Al Glassett and Medwin Matthews attended the luncheon sponsored by the Technology Club of New York

during the annual meeting of the American Society of Civil Engineers in January.

A welcome letter from Dolly Gray informs me that he also has a son, Harland, Jr., taking aeronautical engineering in the V-12 unit at M.I.T. Dolly is eastern district manager for the Cleveland Automatic Machine Company, with offices in the American Insurance Building, 15 Washington Street, Newark, N.J. Howard Field is at 3625 Fairway Boulevard, Los Angeles. Albion Doe has a new address, 100 Overlook Circle, New Rochelle, N.Y. Charlie Hart is at 227 Orwood Place, Syracuse. Bill Finlay is now in Kirkwood, Mo., at 1607 Dearborn Drive. Harmon Deal has left New Jersey and is now in Bloomington, Ind. Ernie Bangratz has also departed from New Jersey and is in Lancaster, Pa., at 1008 Seventh Street. G. R. McNear has left Detroit and is in Los Angeles with the United States Rubber Company, 5675 Telegraph Road. Erwin Harsch's address in Knoxville, Tenn., is 114 Fountain Avenue. Clyde Hall is now in Tampa, Fla., at 464 Lucerne Avenue. — HAROLD BUGBEE, Secretary, 7 Dartmouth Street, Winchester, Mass.

1921

With the arrival of the annual call to subscribe to the Alumni Fund go our sincere thanks for your generous support and the increasing participation of the Class as a whole. President Compton's Alumni Day report on the state of the Institute and his annual report mailed to all Alumni in the fall give ample evidence of the need for our aid and of the outstanding services to which Technology is dedicating itself in addition to its educational program. Now of all times our efforts to repay in some measure our debt to the Institute mean a great deal, not only to help it maintain its position in these difficult days for educational institutions but also to insure the continued success of its countless services directed toward winning the war. Your tangible returns are Alumni Association membership and The Review, which account for \$5.00 of your contribution. All over that amount applies to Institute projects. Our quota is \$16 per man. Send a generous check to Cambridge now.

Alumni Day, February 26, provided the occasion for one of the largest gatherings of the Class in a nonreunion year. Josh Crosby was chairman and Lark Randall a member of the committee which planned the Stein-on-the-Table Banquet for an enthusiastic assemblage which overflowed the confines of the Statler ballroom. Phil Nelles, a major of Ordnance, was our sole representative from the armed forces. Others in attendance included John Barriger, Scripps Booth, Cac Clarke, Chick Dubé, Fritz Ferdinand, Vic Homerberg, Mel Jenney, Al Kiley, Chick Kurth, Don Morse, Warrie Norton, Charlie O'Donnell, Leo Pelkus, Ray Presbrey, Ace Rood, Slide Rule, Jack Sherman, Tommy Thomson, Al Wechsler, and Charlie Williams. The committee of hosts to the two graduating classes included Vern Cole, Ed Farrand, Fritz Ferdinand, Vic Homerberg, Irv Jakobson, Al Kiley, Chick Kurth, Leo Mann, Don Morse, Warrie Norton, Tom Proctor, Lark Randall, Al Wechsler, and Cac Clarke.

Leo C. Pelkus, X, has emulated the example of the Zoller and Conant families with a recent addition to the vital statis-

1921 Continued

tics. Diane Lee was born on January 5. One of the few remaining bachelors at the time of our 20th reunion, Leo was married in June, 1942, to Vivian Wheaton. He maintains a Boston office as a distributor of electric heating equipment. — The engagement has been announced of Margaret L. Auert of Utica, N.Y., to Bruce F. Rogers, X, of Rye, N.Y.

Charles A. Morss, XV, has been elected chairman of the southern New England section of the Society of Automotive Engineers. Charlie is a designer with the Pratt and Whitney aircraft division of the United Aircraft Corporation, East Hartford, Conn. — Edgar Erskine Hume, a permanent colonel in the Medical Corps, is the regional civil affairs officer of the Allied Military Government in the Naples area, according to an article in the edition of the *Stars and Stripes* published in Italy. Brigadier General Hume is the author of the book outlining the history of the Medical Corps, *Victories of Army Medicine*, published last year by Lippincott. — T. Dillwyn Dutton, VI, is with the Bell Telephone Company of Pennsylvania, located in Philadelphia. Tom was present at a meeting of the Philadelphia section of the American Institute of Electrical Engineers, at which your Assistant Secretary gave a paper on selenium rectifiers, and we celebrated our first meeting since leaving the Institute. Also present was Dugald C. Jackson, Jr., VI-A.

Over 15 per cent of the Class are now in service, represented by 99 in the Army and 36 in the Navy. Three are major generals, ten are brigadier-generals, and two are rear admirals. Of the Army group, colonels are most numerous, represented by 29, and in the Navy, lieutenant commanders, represented by 12. Changes in rank and additions to the list are given in the "M.I.T. Men at War" section.

In the following list of new addresses, military personnel have been omitted, since your letters for members of the armed forces will be properly forwarded if addressed in care of the Alumni Association, M.I.T.: Herman Broockmann, I, Sanderson and Porter, Post-office Box 38, Substation H, Louisville, Ky.; Frederick M. Gahagan, X, Gahagan Construction Corporation, 90 Broad Street, New York, N.Y.; Edmund I. Howard, XIII, 56 Green Street, Fairhaven, Mass.; and Charles L. Phillips, XV, San Clemente, Calif. — We want your news, especially letters from men in service. Include a note for your Secretaries when you respond to the Alumni Fund call. — RAYMOND A. ST. LAURENT, *Secretary*, Rogers Paper Manufacturing Company, Manchester, Conn. CAROLE A. CLARKE, *Assistant Secretary*, Federal Telephone and Radio Corporation, 1000 Passaic Avenue, East Newark, N.J.

1922

We shall devote these notes exclusively to the Alumni Dinner, held at the Statler Hotel in Boston on February 26. In particular we ask the attention of those of our Class who are within easy access of Boston yet who do not attend these affairs. The cocktail session before the dinner has become a firmly established 1922 tradition. Make your resolution now to attend next year. You won't regret it, and we wager you won't miss another annual banquet if it can possibly be avoided.

The register this year carried 44 names and there may have been others who missed getting their names on the list. This is by far the largest gathering at any Alumni Dinner, and we saw many new faces. At least a dozen of the men came from distances of over 100 miles: Ash from Detroit, Ferguson from Buffalo, Shirey from Rochester, and groups from Washington, D.C., and New York. Headquarters as usual were in Whit Ferguson's room at the Statler Hotel. Our Class was well represented at the speakers' table by Lieutenant Colonel Joe Cook, who heads the Army training schools at M.I.T., and by Frank Gage, who arranged the music and played the piano for the new Technology song, *Sons of M.I.T.*

I am sure the following list of attendants join in assuring those who did not attend that they missed a rousing good time: Parke D. Appel, Ed Ash, Harold O. Berry, Rudie Blatter, Mort Bloom, Ferris Briggs, Robert H. Brown, Charles H. Burnham, Yard Chittick, Harold A. Connor, Joseph F. Cook, Jr., Arthur B. Craig, Malcolm G. Dodge, Jim Duane, Buck Eacker, L. Winslow Emerson, Warren T. Ferguson, Whitworth Ferguson, Frank D. Gage, G. Dewey Godard, Dwight Gray, Clayton D. Grover, W. Raymond Hewes, Ralph W. Leach, George G. Marvin, Ted Miller, Chester A. Moore, William H. Mueser, August P. Munning, Randy Myer, Harry L. Pearson, Marjorie Pierce, William D. Pinkham, George W. Potter, Archibald F. Robertson, Frank H. Russell, William W. Russell, Roscoe E. Sherbrooke, Hugh M. Shirey, Florence W. Stiles, A. Robert Tonon, John L. Vaupel, Everett W. Vilett, and Harland A. Wilbur. — CLAYTON D. GROVER, *Secretary*, Whitehead Metal Products Company, Inc., 303 West Tenth Street, New York, N.Y. WHITWORTH FERGUSON, *Assistant Secretary*, Ferguson Electric Construction Company, 204 Oak Street, Buffalo, N.Y.

1923

Bill Scofield's many friends will be sorry to hear of his death on January 11. I have no further facts. — Per K. Frolich of the Standard Oil Development Company, retiring president of the American Chemical Society, was tendered a dinner in January by the north Jersey section of that organization.

Jack Beretta called me up on passing through Boston recently. He is a lieutenant colonel in the Corps of Engineers and is located at Fort Belvoir, Va., having spent something over a year in service in Newfoundland. — A welcome Christmas card among those received was from José C. Bertino of Buenos Aires. Bertino was, at last report, an engineer commander in the Argentine navy. As I write these notes, I am getting ready to go to the 1944 Alumni Day Dinner. If I remember rightly, Bertino was one of the '23 group at the Alumni Day Dinner in June, 1940.

At the Technology Club of New York luncheon held in January during the annual meeting of the American Society of Civil Engineers, four '23 men were present: Bill laLonde and Jim Robbin, who have been mentioned fairly recently in these notes; R. T. Colburn of the Tennessee Valley Authority, Knoxville; and William S. Wise of the State Water Commission, Hartford, Conn.

Professor Locke '96 sends in some information about two men. Among the 1,223 Americans repatriated from Japanese internment camps who arrived in New York City on the *Gripsholm* on December 1 was Gilbert Whitehead, formerly field engineer for the Philippine iron mines. He was caught in the Philippines at the outbreak of the war and with some 300 Americans had been interned at the Santo Tomas University in the outskirts of Manila. Whitehead maintains his official mail address in the United States in care of his sister, Mrs. Horace Blackmer, 62 Earl Street, Malden, Mass. He himself flew to Brazil in January to take charge of an iron mine in that country. His wife and family remain in Malden.

Professor Locke's other item concerns Edwin R. Richards, who has been named superintendent of the open-hearth and foundry departments of the Geneva Steel Company, at Geneva, Utah. Richards has had extensive experience in steel plants, both in Mexico and in this country, and was until recently with Shields and Company in Mexico, D.F. For several years prior to that connection he was assistant superintendent for the Carnegie-Illinois Steel Corporation in Chicago, Ill.

We have a thumbnail sketch of Forrest F. Lange from the Springfield, Mass., *Republican*. He has been appointed production service specialist at the New England regional headquarters of the War Production Board in Boston. Lange has been a mechanical engineer in industrial production with the War Department since April, 1941, and has been connected with the Springfield Ordnance District in various engineering and production capacities. He is a member of the executive committee of the western Massachusetts section of the American Society of Mechanical Engineers. — HORATIO L. BOND, *Secretary*, 457 Washington Street, Braintree 84, Mass. JOHN M. KECK, *Assistant Secretary*, 207 Bloomfield Avenue, Bloomfield, N.J.

1926

The Class has reason to be proud of the new Technology song, *Sons of M.I.T.*, and of its composer, John B. Wilbur. This song was published in the March issue of *The Review*, and it was first sung at the Alumni Banquet on February 26. It is always difficult to forecast how songs will take hold, but it appears that this may be one of the most successful of all the Technology songs. In addition to John Wilbur, who was a guest of honor at the head table, other '26 men at the dinner included Don Cunningham, Arthur Johnson, Francis D. McKeon, Bob Dawes, Chet Buckley, Earl Wheeler, Stewart Perry, and Louis Darmstadt.

William H. Stell, Jr., for 17 years an engineer with the Rochester Gas and Electric Corporation, has taken over the Arnold R. Hamman Company of Buffalo, dealers in electric automatic controls and valves. — William J. Murphy, captain, United States Navy, and Mrs. Helen Essary, columnist for the *Washington Times-Herald*, were married on January 7 in Baltimore. — The Secretary received a letter recently from C. B. Galphin, who is with the aircraft division of R. H. Bouligny, Inc., at Charlotte, N.C. Before making aircraft parts, he was engaged in building transmission lines. — JAMES R. KILLIAN, JR., *General Secretary*, Room 3-208, M.I.T., Cambridge 39, Mass.

1927

We unrolled the cardinal and gray plush carpet a few weeks ago when Howard Ferguson appeared on the 38th floor of the R.C.A. Building in New York. Ferry now resides in Shaker Heights, Ohio. He is in charge of refinery operating control for the Standard Oil Company of Ohio. He was promoted to this position in January, 1943, having formerly been chief chemist for the same company. The M.I.T. Association of Cleveland has depended on Howard for a share in its leadership for many years. As an honorary secretary of M.I.T., he has interviewed many of the prospective freshmen before they were accepted by the Institute. Tennis and badminton are still on his list of activities. His children are Ann, seven, and John, four. Your Secretary is indebted to Ferry for much of the following information on members of the Class.

Art Connell is one of the few remaining bachelors in the Class. After traveling far and wide for E. B. Badger and Sons Company of Boston, he is now in Boston as design engineer for that company. One of the outposts visited by Art was the Canary Islands, where he supervised a Badger installation. — Henry Steinbrenner is still in the steamship business in the Rockefeller Building, Cleveland. Hank is remembered for a variety of activities during his undergraduate days: among them, his sterling play in The Tech-Technique football games of 1925 and 1926. By comparison, his present post as chairman of the scholarship committee of the M.I.T. Association of Cleveland seems very sedate. — The present Secretary-Treasurer of the Cleveland Club is Frank Rhinehart. Frank is with the war housing administration in Cleveland for the duration.

The Class has a member seeking the Republican nomination to the Maine Senate. This is Charles A. Bartlett, State Representative from Portland. Bartlett charges that the Fernald Law prohibiting export of hydroelectric power from Maine is "archaic" and promises that, if elected to the senate, he will suggest its repeal. He sees a considerable market for Maine power in Boston. — Although the era of numerous weddings is long since past for our Class, we learn that the wedding of Fernando O'Connell and Paul V. Foley took place on January 16 in Brooklyn, N.Y. Paul is with Babcock and Wilcox.

News of the following promotions has been received: Edward C. Craig, Bureau of Ships, United States Navy, Washington, D.C., from lieutenant commander to captain; Reginald F. Jacobs, Camp McCain, Miss., from major to lieutenant colonel; of R. Folsom Hayward, Army Air Base, Lubbock, Texas, from captain to major; and James D. Flagg, Camp Lejeune, New River, N.C., from first lieutenant to captain. — JOSEPH S. HARRIS, *General Secretary*, Aviation Department, Shell Oil Company, Inc., 50 West 50th Street, New York 20, N.Y. DWIGHT C. ARNOLD, *Assistant Secretary*, Stevens-Arnold Company, Inc., 22 Elkins Street, South Boston 27, Mass.

1934

Dick Miller has been appointed development engineer for stainless and alloy steels in the department of technology and research of the Carnegie-Illinois Steel Cor-

poration. Dr. Miller, who was associated with the United States Steel Corporation, will be in charge of promotion and co-ordination of the company's interests in stainless and alloy steel products.

We have a transcript of a letter from Sam Joroff, a captain in the Air Service Area Command, written to Walter C. Voss '32, Professor of Building Engineering and Construction at the Institute. It will cast a few highlights on what Sam is doing: "Some happy and successful landings have already occurred since you wrote. My section has recently been attached to the engineer section, Northwest African Air Forces. I'm spending most of my time on construction problems. For temporary buildings, we're using adobe walls. The mud bricks are made by native Arab labor on the job. Straw, clayey mud, and limewater added to the mortar water produce a fairly good building block after three to five days of drying in the sun. Whatever the problem may be, the engineers will always find a solution. We're a proud lot — especially the aviation engineers. Our troops have been commended by the commanding general for building airfields faster than the Air Forces could use them."

Frank Brazel is on the way to becoming a benedict. He is engaged to Gretchen Heins, daughter of Mr. and Mrs. Elmore D. Heins of Roanoke, Va. The date of the wedding has not yet been set. — Plans for the tenth annual shindig are progressing under full steam. The committee in charge is doing a swell job, and you may look forward to a get-together that will make history. — JOHN G. CALLAN, JR., *General Secretary*, 184 Ames Street, Sharon, Mass. ROBERT C. BECKER, *Assistant Secretary*, First Special Service Force, care of Postmaster, New York, N.Y.

1938

Word has just come that Bob Robbins took the big step last November. He married Anne Howard in Baltimore. Chauncey Bell was best man. Bill Bender was an usher. Bob and his bride are living in Seattle. — In December, John White married Emily May Anderson in Wilmington, Del., and they are now living just outside the city. — Sid Baron was married to Florence Lazerow. He is a lieutenant, junior grade, with the Central Concrete Laboratory and is stationed in New London, Conn. — Leonard Dowding was married around Christmastime to Mary G. Stevenson at Port Washington, L.I. He is working for the Texas Company in New York.

Bill White is reported missing. He was a yeoman on the submarine *Wahoo*, which is presumably lost. He left for Pacific duty two days after his marriage last May. — Bob Flanagan was awarded the Purple Heart for his part in the Dieppe raid a year or so ago.

Fred Crocker, a lieutenant in the air division of the Marine Corps, is stationed at Cherry Point, N.C. Paul Black is a captain in the Signal Corps with the First Army in England. Dave Torrains is a first lieutenant at Edgewood Arsenal. Jack Cunningham, a private, first class, is studying at Pratt Institute. Tenney Clough, who was, until recently, maintenance engineer for Nashua Gummed and Coated Paper, is now an ensign. He took a training course at the Institute and has already been shipped

out. Dick Stresau is in the Naval Ordnance Laboratory in Washington.

Gordon Hunt is a metallurgist with the Torrington Company in Connecticut. He had a little girl about two years ago and added a boy to the family in February. Congratulations, Gordon. Your Assistant Secretary, too, has become father of a son born on February 25. Everything went nicely, and we're two very proud parents. — DALE F. MORGAN, *General Secretary*, Carbide and Carbon Chemicals Corporation, 30 East 42d Street, New York, N.Y. ALBERT O. WILSON, JR., *Assistant Secretary*, 32 Bertwell Road, Lexington 73, Mass.

1941

A letter from Al Bensusan, a captain in the Air Forces, speaks for itself: "The first copy of The Review that I've seen since arriving in India in May of 1942 came this afternoon. It was the November issue, and I beg to disagree with your statement about one's not being able to go on foreign service by applying for overseas assignment. It's a heck of a lot easier getting here than getting out. After 20 months in India, however, and 22 since this chicken left the States, I have hopes that my number is coming up at last and that I shall be back in April. I've had a lot of experiences, a lot of fun, and a lot of headaches and am now in the technical inspection part of the Air Forces with a job in engineering on the side. Reading about the fellows in The Review was like a letter from home. Dick Wiener is supposed to be over here somewhere, but I do not know where. I am still a bachelor, no doubt owing to my absence. . . . According to the statistics of '41, we should say that this is an abnormal status."

A surprise note from Rog Finch, a captain in the Army, says: "On November 26 I received orders assigning me to the Rome, N.Y., air base as base weather officer. The next day I received a telegram from General Arnold releasing me from the Air Forces and reassigning me to the Quartermaster Corps at the Jeffersonville Quartermaster Depot. On arrival here, I found that I was to be in charge of textile research and development in the engineering division."

Charlie Whitney, a captain in the Air Forces, has been transferred from the Desert Center Army Air Field to Fort Mason, San Francisco, where he has a permanent job. He isn't too pleased, because he was all set to go overseas. I haven't heard from him in a couple of months. Howie Samuels was last heard of as a major at Fort Dix, where he had been since last spring. Rog Morse, a first lieutenant, is in England. Karl Wenk '42 passed his major exams for a doctor of science degree in Chemical Engineering. I had lobster with him in Boston at Ye Olde Oyster House on February 17. I also had a few hours with Mr. and Mrs. Shep Tyree at their home on Park Drive, Boston.

Don Howard is a major with an A.P.O. address out of New Orleans. Another major in the New Orleans A.P.O. group, Norm Shapira, dropped in to see us. Traveling with his wife, Norm was headed for Fort Benning and the infantry school. According to Bernard Ericson, an ensign in the United States Naval Reserve stationed at Todd-Johnson, New Orleans, Jesse Owens was working in West Virginia, married, and later moved up to Buffalo,

1941 Continued

N.Y. Burnapp and Dick Owen were at Princeton when last heard of, says Eric. Jack Heist, Walt Hudson, and Stan Jarrow are all captains with A.P.O. addresses out of New York. Erling Hustvedt, a Navy lieutenant, is F.P.O.-ing out of New York. Walt Ennis and John Potter are Army lieutenants with addresses out of San Francisco. Stan Hand and Art Stevens are at the Institute. Ed Hayes, a captain in the Army, is in Washington, as is Paul Erlandson, a lieutenant in the United States Naval Reserve. Monroe Norden is with the arms and ammunition proof division at the Ordnance research center, Aberdeen Proving Ground, Md. Both captains in the Army, Grover Rose is at Camp McCain, Miss., while Thayer Rudd is at Camp Swift, Texas. Harry Sosnoski is a commander of Naval Air Operations Training at the Naval Air Station, Jacksonville, Fla. Frank Springer, lieutenant commander, is at Mare Island, Calif., and Atwell Smith, a captain in the Army Air Forces, is in Washington, D.C. Lieutenant Bruce Beard is at the Pittsburgh Replacement Depot in California. At Wright Field we find Captains Ray Berry and Mitch Marcus.

We had information to the effect that Reid Weedon was still in Philadelphia, a lieutenant at the Naval Air Experimental Station, and we noted a leading article by Reid on moisture-vapor-proof packing in the October issue of *Packing and Shipping*. Upon our current reassignment to Philadelphia, we checked up on Reid and found him to have departed for the South Pacific a few weeks before. We also saw a picture in a current textile monthly which showed Mert Richardson of the Cooks and Bakers School awarding an Army-Navy "E" to a textile concern in the East. We looked up Mert during a recent trip to New York only to find that he had been transferred a few weeks before to the Chicago Quartermaster Depot.

Returning to Philadelphia, we found that according to the university roll at the Officers' Club, John Sexton, a lieutenant in the Springfield Ordnance District, had been there 10 days before. We bumped into Ray Frankel '43 and discussed changes at the Institute. A day later Rog Blum, a lieutenant now stationed at the Philadelphia Navy Yard, called to say he had observed our scrawl in the roll book. Rog had little information concerning the group of '41 men who had attended the Naval Academy in late 1941. Apparently they had been thoroughly scattered.

The Class received another hard blow in the news of a plane crash at the Naval Air Station at Pensacola, Fla., on January 5, causing the death of James Hollister Ferguson, a lieutenant in the United States Naval Reserve. Jim had entered the Institute in his junior year, transferring from Rice Institute. He majored in Metallurgy and was a member of the American Institute of Mining and Metallurgical Engineers. His interests at school included the Combined Musical Clubs; his fraternity was Phi Delta Theta. We do not like to remember Jim as a chap who could knock off a couple of dean's lists but as a classmate who saw at the outset what his share of this conflict comprised and set about doing his part. He died in the performance of that duty. We know of no greater tribute to be paid to any man in '41. We join Frank

Ball, Mario Conti, Lewis Fykse, Ed Hayes, John Macleod, Art Mitchell, Russ Palmiter, John Potter, John Sanderson, Bob Smith, and George Vineyard in extending to Jim's parents the sincere condolence of our Class. We will see to it that their son's sacrifice has not been in vain. — STANLEY BACKER, *General Secretary*, 2506 South Cleveland Street, Philadelphia 7, Pa. JOHAN M. ANDERSEN, *Assistant Secretary*, 136 Beacon Street, Boston 16, Mass.

1942

With the outdoors getting greener by the day, and no more salaaming in front of the local ration board for B.T.U.'s for the furnace, perhaps your Secretaries can again approach the mailbox with a bushel basket. News is a little thin again this month, but there is a general indication that things are getting tougher and tougher for the bachelors still left.

Perhaps the biggest story of all is of Lieutenant Bill Kellogg, X, through the courtesy of the War Department. When President Roosevelt decorated Lieutenant General Mark W. Clark and five others in Sicily with Distinguished Service Crosses, one of those five was Bill Kellogg. The citation is as follows: "For extraordinary heroism in action from September 14, 1943, to September 28, 1943, between Paternapoli and Montello, Italy." The compelling story of his adventure in enemy territory was published in *Collier's* for November 27, and the complete citation which accompanied the decoration appeared in *The Review* for February (page 209).

Recently recipients of wings of the Army Air Corps, after completing advanced flying school, are Robert Kunz, Frederick Field, Okla., and William Traupe, Aloe Field, Texas. Captain Traupe will probably be flying fighter planes, while Lieutenant Kunz is after something with more than one motor. From Pampa, Texas, comes word that Aviation Cadet John Davison probably is also wearing his wings and flying a bomber somewhere. He likewise has bars on his shoulders. Before entering the Army he was one of the many classmates at Carbide and Carbon Chemicals Corporation in South Charleston, W.Va.

As for the nuptials and nuptials to be, Bill Tallman and the former Jean Gysan are now to be found at home in Cambridge. Lieutenant (junior grade) Al Frueh and Anne Torrey were married in New Haven, Conn., just before Christmas. Charlie Ricker, XV, who is now doing work at Technology in a "war research laboratory," has confined his social activities to Suzanne Keller of Skidmore. Charlie received his master's degree in Course XV last year. Ted Eliot, X, also one degree past most of us, and now working in the Chemical Warfare Development Laboratory (the construction of which we witnessed) and Mary Ann Langley of Simmons are preparing themselves for the main event soon. Dave Herron '41, X, and George Schwartz '42, were ushers when Hugh Schwarz was married in Bangor, Maine, to Mary Louise Connors. The Schwarzes are now living in Brookline. Ensign J. Edward Krauss and Jeannette Taggart were also married just in time for Christmas, in Brooklyn. Ensign Dick Owen and Margaret Louise Jones, also about to be graduated from Skidmore, were married

on Christmas Day in New Haven, Conn. Dick is now stationed at the Boston Navy Yard.

By the time this reaches print, your Secretary expects to be using another Army address, perhaps one similar to Jack Arend's. May even have a couple of changes by that time, who knows? Mail to Golf, Ill., always brings results — eventually. To all you good people who have written your Secretary, many thanks, and somehow, sometime, an answer shall be forthcoming. — FREDERICK W. BAUMANN, JR., *General Secretary*, Orchard Lane, Golf, Ill. KARL E. WENK, JR., *Assistant Secretary*, 228 Marlborough Street, Boston 16, Mass.

1943

This month the problem is not, as previously, to be as wordy as possible, but to know where to begin. Spring really must be on the way, for Cupid has been active. As evidence, I record the engagements of Bob Anderson and Patricia Durbin; of Ronald Miller and Margaret Connolly; and of Elgar Pennington and Mary Jane Mitchell. John Shutack and Suzanne Foster have also announced theirs. Ensign Shutack is at present a navigator overseas with a naval transport unit. Ensign Albert Bakker and Jacquil Bland are engaged, as are Ted Lindsay and Dorothy Cole. To close the glad tidings of the month, we note that engagements have been announced for Lieutenant Myron Shoffner to Beverly-Jean Fairweather and for Lieutenant Ward Haas to Jane Corya.

I have two very official-looking documents, the first of which announces that Cecil Alexander is now a captain in the Marine Corps, for which he pilots a Douglas Dauntless somewhere in the Pacific. The second states that Lieutenant Frederick Mueller has been graduated from Frederick Field, Okla., as a bomber pilot. Ned Swanberg arrived in the ordnance school about two weeks ago and has news of Mike Salvatore, whom he saw in Baltimore. Apparently Mike is headed for the Radiation Laboratory at the Institute.

Also in Baltimore is Deke Bowers, an ensign in the Navy, who writes: "George Slifer, Russ Goldberg, and I (all XIII) went to the Norfolk Navy Yard in May. Russ had been married during the latter part of indoctrination school at Fort Schuyler, and his wife went to Norfolk with him. George and I roomed together until I was transferred here. Then he married Betty Johnson of Boston. I'm not sure that George and Russ are still there, but I think so. George and Betty were there at Christmastime. I'm attached to the Baltimore branch of the Norfolk Navy Yard. Have been here some months with no change foreseen in the near future. We turn out quite a few auxiliary vessels. George Theriault, XIII-C, is assigned to a repair ship, but I haven't seen him. He wrote me recently that for the past 10 months he had been in the port director's office in New York. As far as I know, he is the first of the XIII boys to get sea duty, but that fact is not definite. Maurice Evans, XIII, a 'sub-lieutenant' in the Royal Canadian Naval Volunteer Reserve, has been on shore duty at Ottawa (latest news at Christmas)."

Eliot Payson, a lieutenant in the automotive division, stationed at Aberdeen Prov-

1943 Continued

ing Ground, has news of Herb Johnson, who is with General Electric in Schenectady, N.Y. Eliot says that Phil Mork is also there.

News has recently come to hand of George Floyd, who started at midshipman's school in New York last August and was commissioned an ensign in October. He applied for submarine service and was assigned to a training sub on the coast. Later he went to submarine school at New London, Conn., and thinks that when he is graduated he will be assigned to the Pacific. Jim Harno is also stationed at New London. Bud Hathaway is an ensign assigned to the staff of the fleet torpedo school at San Diego, Calif.; and Stew Hill is in Wallingford, Conn., with a bronze alloy plant.

We hear that George Nelson is now in St. Louis at a naval aircraft assembly and repair shop. He was previously in Minneapolis and Los Angeles for a few months each. Lieutenant Curt Smith has passed on news from Stan Roboff, a lieutenant in the Army now in Tennessee. The latter is with Bud Babcock, and they are assigned to some "terribly secret" work down there. Stan says that Lieutenant Sherman Sackheim is now hobnobbing with the Arabs in North Africa. Sackey apparently likes it a lot but regrets that he cannot get to Bryn Mawr as often as he would wish.

Martin Winter has written: "After working for the Calco Chemical Division of the American Cyanamid Company in Bound Brook, N.J., for eight months, I transferred and have since then been doing research for the Army at Columbia University. During the first three months I made a round trip of a little over 50 miles a day from home, but then at the beginning of the fourth month I moved into an apartment in the Big City with five other fellows. Since then I have been leading an active, if not an impressive, life. I am once more getting about the same amount of sleep that I got while at Technology. During an excursion through the Gay White Way, I ran into Johnny Sullivan and date. He is now a second-year Army student at Cornell Medical College, New York, and is doing all right. About two weeks ago I received a letter from one of my former roommates, Tony Badia, who writes from Santa Clara Province, Cuba, that he has finally begun work in a foundry there after an extended vacation. The other of my Cuban roommates, Carlos Hevia, who returned to his native land, is still a man of leisure, according to all reports. Dick van Voorhees is working for the British Admiralty in Bridgeport, Conn., at the Bullard Company."

News of Gil Edelman reads: "I am at present working in the strength-test group at Douglas in Santa Monica, Calif. You know — everything from proof testing a rivet on up! Testing materials lab with a pay check — interesting, though. Also at Douglas are Yet Yee, Bob Anderson, Wally Dunn, Larry Stumpf, Johnny Stetson, Don Dissly, Ronny Smith, Herb Sanderson, and Bill Wilson. Incidentally, this Los Angeles

climate is all they say it is. I'm still not used to a February day that is 85 degrees in the shade. It really is God's country."

A short note is at hand from Hans Walz, a lieutenant in the Ordnance Department: "Wes Train, Ken Warden, and I went to Ogden Arsenal, Utah, in June and stayed there until September. Then Wes and Ken went to the Pittsburgh Replacement Depot, Calif., and are still there, I think. Bill Cain is there, too. I transferred to the Signal Corps and landed down at Drew Field, Fla., but am now going to the intelligence school in Harrisburg, Pa., and hope to transfer to the Air Forces on completion of the course. Bill O'Neill got a medical discharge from the Army. He was in an anti-aircraft battery at Camp Davis. Bill tried everything to stay in, but no such luck."

Finally, I have an exceptionally interesting letter from Read Stevens, an ensign in the Navy: "At last I've been to a real, honest-to-goodness, South Sea island. Unfortunately, however, I'm still on one. It's in the Gilbert group — the Tarawa Atoll, in fact. The islands are flat, at the most 10 feet above the sea, and covered with coconut palms. In places there is fairly thick undergrowth; in other places it is very slight, with a clean sand of broken coral floor. The islands are all oblong in shape, at the widest about a mile and at the longest not more than three miles. On the ocean side the trees come to within 20 feet of the water, leaving a nice clean, sandy beach. About 400 yards from the sand is a coral reef. At high (full moon) tide there are some four feet of water over the reef, and at low tide the reef is dry. The water is clean and about 75 degrees in temperature. In most places the lagoon is very shallow and full of moray eels and giant clams — the kind that catch people's feet and make them hack them off to escape."

"The general health on the islands is pretty good. They are free from malaria, but there are millions of the other kinds of mosquitoes. They breed in the taro pits (Taro is a water plant that has a starchy root, from which the natives make a paste used in place of bread), in the opened coconuts, in the water collected in palm fronds, and in a thousand other places, making mosquito control almost impossible. There is an infinite number of flies, too. Fortunately, however, there is usually a good ocean breeze that keeps the insects away and keeps us cool — if we lie perfectly still. The humidity is very high. Many of the natives are mottled with white patches — which are pellagra, I'm told. It doesn't seem to bother them, though. A few also have hacking coughs, which might be tubercular. The health of our men is excellent, except for almost everyone's having had the 'Tennessee quickstep,' probably owing to the change of food and water. The food is all canned and pretty good, and the water is all distilled. There is fresh water almost anywhere if one digs about four feet, but it is not supposed to be fit for drinking. The

fauna of the islands are limited to the natives' pigs and chickens, and to rats, little lizards about the size of salamanders, very large land crabs that could just be crammed into a large derby hat, hermit crabs that live in old snail shells, white terns, and a black bird about the size of a small crow that flies at night and makes a noise that sounds like a boy running a stick along a closely spaced picket fence.

"We are now living in big Army tents, and we may get electric lights. We have cots with mosquito netting, and there is talk of mattresses and pillows for the officers. For the first few weeks we slept in pup tents on our ponchos, and it was very wet during heavy rains. It is damp here all the time, and leather goods get moldy if not taken care of. There is sand in everything, as at the beach in the States. You can have the natives do your laundry for a cake of soap and a couple of packs of cigarettes, and they do a swell job — ironing and all but starch in the shirts. We don't wear shirts anyway, except when working near flies or mosquitoes."

"Believe it or not, the islanders are about 80 per cent literate. It seems that some missionaries analyzed the language and put it in writing. Then the British came and wanted copra. The natives, naturally, didn't want to work any more than enough for their food. So the British set up the King George V School and educated them, chiefly teaching them to read. When they could read, they wanted a million things they didn't have or need. The British let them work for British money, and with the money they could buy British goods. Great thing, education. Before the British came, though, the inhabitants had not been very advanced, because they had everything they needed for a comfortable life. They make excellent waterproof huts, strong and airy, bound together with a very tough twine made from coconut-husk fiber. I don't know what they used for knives — probably shells. The natives also make excellent outrigger canoes with sails of cloth likewise made from coconut fiber. They make first-class mats from coconut fronds. You are probably aware by now that without the coconut tree the islanders could hardly exist."

"In the books, these people are listed as Micronesians, but they sure look mixed up: Some of them have fine oriental features, and some have coarse oriental features; some have fine and some have coarse Polynesian features; some of the men have beards, and some don't. They are all about 5 feet 4 inches tall and stand very erect. They are quite husky, too. Their complexion is about that of a medium Negro; their hair is jet black and slightly wavy. The men wear a cloth 'skirt' made from the same stuff as the sails on their canoes, and the women wear a grass skirt, and nothing else. . . . The best thing about both the men and women is the intelligent look they wear on their faces."

— CLINTON C. KEMP, *General Secretary*, Barrington Court, 988 Memorial Drive, Cambridge 38, Mass.



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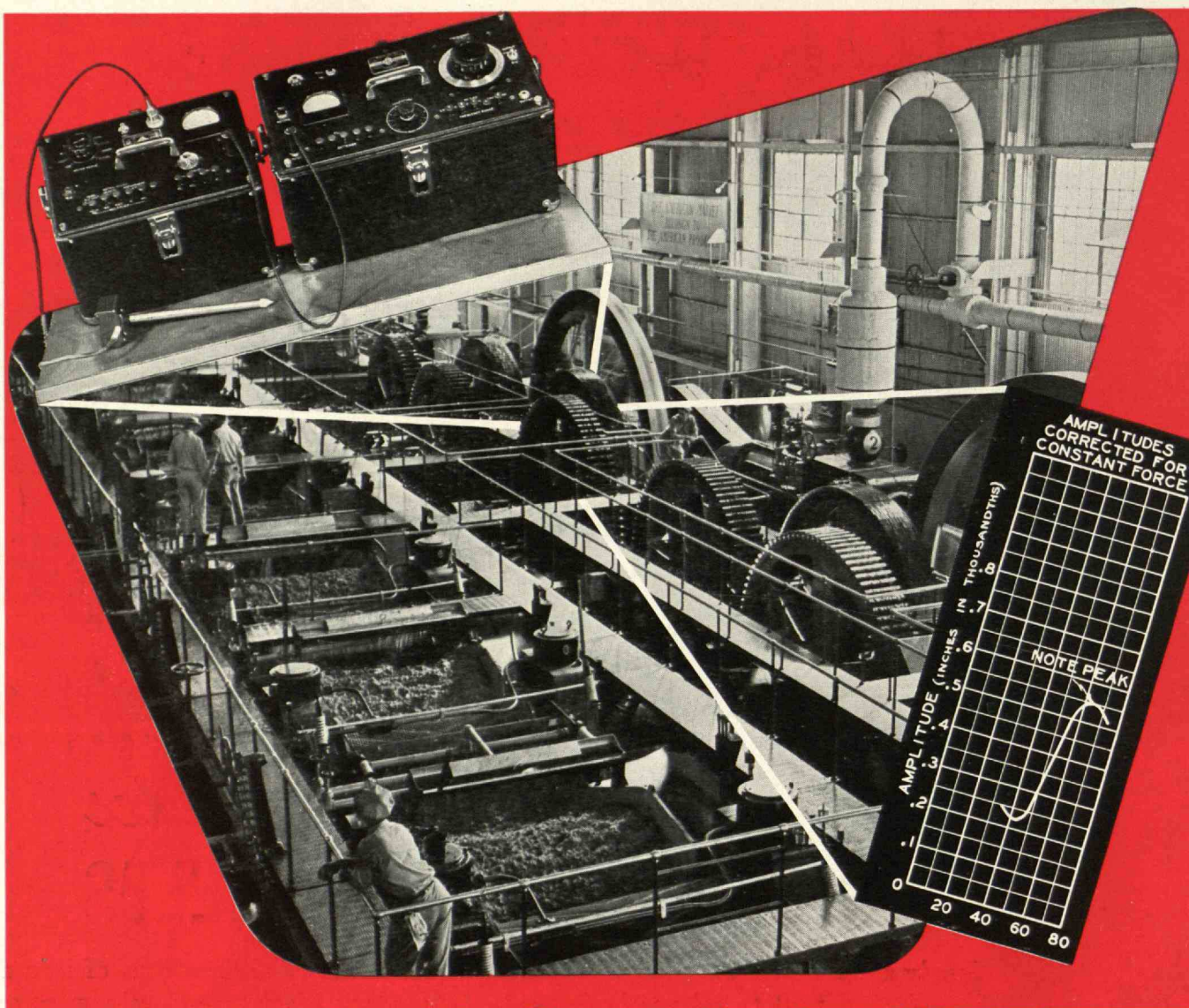
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